THE FAR EASTERN REVIEW

FOUNDED BY GEORGE BRONSON REA
36TH YEAR OF PUBLICATION

In This Issue

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遠東時報

FAR EASTERN UNCERTAINTIES

HOW MUCH CAN AND WILL RUSSIA AID GERMANY?

FRANCE IN THE FAR EAST

Vol. XXXVI | APRIL, 1940 | No. 4

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXXVI SHANGHAI, APRIL, 1940 No. 4

FAR EASTERN CROSS-CURRENTS

ALTHOUGH there have been serious divergences in national policy and outlook between Great Britain and Japan, real differences have been overlaid by a mass of misunderstanding and misrepresentation too often fostered by the unwelcome attentions of interested third parties, according to the British Ambassador, Sir Robert Craigie, who was the principal speaker on March 28 in Tokyo at the annual luncheon of the Japan-British Society, which was attended by Prince and Princess Chichibu.

The text of the Ambassador's address follows :

" At the annual dinner or luncheon of the Japan-British Society, it is customary for the president to offer some comments on Anglo-Japanese relations. On the present occasion it is perhaps especially fit that I should touch on this question because, after two years and a half in this country, Lady Craigie and I hope to be able to leave next month for a brief holiday in the United States. This will doubtless inspire some of my journalist friends to embark upon their favorite pastime of political speculation, but I should like to assure them from the start that this holiday of ours has no more than a purely private significance.

" In a sense, therefore, this first phase of our work here is drawing to a close, and one is tempted to pass in review the general trend of our relations during that period. None can deny that these years have been difficult—at times very difficult—but there is room for satisfaction in the thought that the innate good sense of our two nations, reflected in the wisdom of their respective Governments, has prevented the animosities of the moment from hardening into deep-seated resentment or permanent estrangement. Two countries which, in the time of their alliance, passed through a period of exceptional prosperity and mutually beneficial co-operation, have witnessed a reaction which, whatever its causes, has been definitely prejudicial in its effects on their political and economic well-being. It would be idle to deny that during that period there have been serious divergences in national policy and outlook, but what has struck me most is the extent to which real differences have been overlaid by a mass of misunderstanding and misrepresentation all too often fostered by the unwelcome attentions of interested third parties. But truth will out, and already there is growing up in each country an appreciation of the extent to which the actions of the other have, during these last years, been vilified and misrepresented.

" Of the fact that difficult and thorny problems still remain to be settled no one is better aware than Mr. Arita and I, to whom these problems present themselves with an unwelcome insistence. But we can at least feel that we have together succeeded in turning some difficult corners and in eliminating some at least of those thorny problems. Bearing in mind the declared intentions of the Japanese Government and the measure of success already achieved, I have a definite feeling of confidence in the future of Anglo-Japanese relations.

" It seems to be an unwritten law in journalism that whereas a quarrel is usually considered to be first-page news, the discovery of an identity of views is hardly worth printing at all. This tendency must respond to some deep instinct in human nature for, ever since my arrival here, I have been struck by the tendency to overemphasize the points of divergence and to forget those very solid similarities in outlook and policy which have always distinguished our two nations. Without falling into the opposite trap of undue complacency, it is nevertheless permissible to recall some of those things which we hold in common : first and foremost I would place our reverential love and deep respect for our reigning houses ; next I place religious tolerance ; then a respect for, and love of, old traditions and customs which go to ensure the stability and durability of our two Empires. There would seem to be an unfortunate tendency in the world to-day to proclaim that because something is new it is necessarily good and that the path of wisdom is to turn one's back upon one's past. Neither in Great Britain nor in Japan do we believe this to be true. This year Japan celebrates the 2,600th anniversary of her foundation. She looks back to her past with pride and from it she seeks inspiration. We in Great Britain also look back to our past in the same spirit.

" Japan and Great Britain are two maritime Powers on the fringe of Continents and vitally concerned with events on those Continents. Methods may in some cases differ, but both countries are ultimately striving for the same objective, namely, lasting peace and the preservation of our institutions from extraneous subversive influences. It is surely not beyond the powers of constructive statesmanship to bring the aims of their national policies into full harmony. It is to the promotion on such mutual understanding that this society has for many years devoted its effort, and I feel sure that I am voicing the wishes of all its members when I express the hope that this goal may be nearer to-day than it has seemed to be these last few years."

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THE speech made in Tokyo by Sir Robert Craigie, British Ambassador to Japan, on March 28 has caused the most painful impression in official circles in Washington, Reuter reports, and comment on the speech ranges from the indignant to the bitter.

Some prominent persons declared privately that the speech had done much to reinforce the " isolationists' " distrust of Britain, which pro-British elements have been striving to dissipate. Other circles are freely forecasting that Britain is preparing to " put over a Far Eastern Munich," which will nullify all that America has done by her financial assistance to China, her abrogation of the Treaty with Japan and her moral embargo, to curb Japan's violation of China's sovereignty and her interference in foreigners' rights and interests in China.

Sir Robert Craigie's words are being unfavorably compared with Mr. Neville Chamberlain's denunciations of Japan at the time of the Tientsin " outrages " last summer.

It is being asked how and when have Japanese action been " vilified and misrepresented," when her conduct of China has been roundly denounced by over fifty nations including Great Britain.—Reuter.

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THE analogy between the British and Japanese positions in their respective world spheres, drawn by Sir Robert Craigie, British Ambassador to Japan, in an address recently, was editorially supported by the *Japan Times*.

In his address, Sir Robert remarked that Japan and Britain are two maritime powers on the fringe of continents and stated that, although " methods may differ, both countries are ultimately striving for lasting peace and the preservation of their institutions from extraneous subversive influences."

" It is quite true," remarked the *Japan Times*, " that just as we are on the fringe of the Asiatic continent, so we are vitally concerned with events on that continent. We are striving there for

lasting peace and preservation of our institutions from 'extraneous subversive forces.' "

Asserting that the campaign in China will be futile unless all efforts were devoted to the cause of peace, on a continent which had known little peace in modern times, the paper added that it was also the Japanese objective to preserve the institutions from external disturbances, as Sir Robert declared Britain was doing in Europe.

While it was not clear to the paper what was meant by " extraneous subversive influences " from the British standpoint, the *Japan Times* pointed out that the allusion could mean only one thing in the case of Japan. These influences emanate from the Communist international, said the paper, declaring that Communism can never be compatible with Japan's national policy. The new order emerging in China under Japanese auspices was dedicated to the destruction of communist forces and the re-establishment of peace, the *Japan Times* declared.

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FOREIGN Secretary Lord Halifax and Parliamentary Foreign Undersecretary Richard A. Butler both denied in Parliament to-day that the speech by the British Ambassador in Tokyo a few days ago implied any change in the Far Eastern policy of Great Britain.

At the same time, both officials emphasized the British Government's profound desire for improved relations with Japan, despite the necessity for continued recognition of the Chiang Kai-shek Government in China and the maintenance of international treaties relating to China.

Foreign Undersecretary Butler was asked in the House of Commons if Ambassador Robert Craigie's recent speech represented any change in Far Eastern policy.

" The Ambassador hadn't any intention of suggesting that our policy has undergone any change," he replied. He said Britain will continue its policy in the Far East " to keep in step with the French and American Governments."

Replying to further questions, Mr. Butler said that due to the world-wide misunderstanding of Ambassador Craigie's speech, " I'll go further and say that the Government sees no objection to improving relations with Japan.

" There's no question of the British Government changing its view of what it must continue to regard as the legitimate Government of China, nor can there be any question of departure from the general attitude it has adopted toward the Far Eastern question."

Foreign Secretary Lord Halifax replied in the same way when the question was raised in the House of Lords, adding :

" The Government, however, doesn't regard its policy as being in any way inconsistent with endeavors to place relations with the Japanese on a more friendly footing."

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A " DIPLOMATIC MYSTERY " is the description given by the New York *Herald-Tribune* to the speech made on March 28 by Sir Robert Leslie Craigie, British Ambassador to Japan.

The speech, says the daily, " implied such an astonishing repudiation of the consistent British attitude towards Japanese policy in China that it seems unfair to comment until news of the British reaction is received or Sir Robert Craigie had a chance to correct misrepresentations, if any."

The paper declares it has seen no such reactions or corrections but there have been assurances from London that there was no thought of withdrawing recognition of the Chiang Kai-shek régime.

" Therefore we must regard the speech as a diplomatic mystery," the *Herald-Tribune* states. " It was incredible as reported and it is incredibly permitted to survive this long as an exposition of British policy in the Far East."

Referring to a statement attributed to Sir Robert that England and Japan were " ultimately striving for the same object, namely lasting peace and preservation of our institutions from extraneous influences," the *Herald-Tribune* comments :

" To Japanese and Chinese this can mean only official Britain's justification of the Japanese army's adventure in China. Therefore Sir Robert Craigie must be read as meaning that Japan is defender of her own peace and China's spiritual health from ' extraneous, subversive influences.'

" No non-Japanese excepting publicists in Japanese pay ever have underwritten the Japanese army's stock excuse as this comparison of British and Japanese war objectives seems to do."

TRUE to the prediction by Sir Robert Craigie, British Ambassador to Japan, that the announcement of his departure for America would " doubtless inspire some of my journalistic friends to embark on their favorite pastime of speculation," newspapers here to-day printed various speculations on his vacation trip.

The *Asahi Shimbun* saw the possibility of a conference between Sir Robert and President Roosevelt or Mr. Cordell Hull, American Secretary of State, when the British Ambassador reached Washington.

It was also possible that they might discuss joint action to be taken by Britain and America towards the reorganized " National Government of China " as well as towards Japan.

All newspapers attached importance to a paragraph in an address made by Sir Robert before the Britain-Japan Society in which the British Ambassador declared that he had a definite feeling of confidence in the future of Anglo-Japanese relations.

The *Yomiuri Shimbun* also saw importance to Sir Robert's statement that both Japan and Britain were striving for everlasting peace and the preservation of their institutions from extraneous subversive influences.

The British Ambassador's statement that the aims of the two nations' policies should be brought into full harmony was regarded by the paper as a suggestion of a joint defense against communistic influences.

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CEREMONIES formally inaugurating the new national government of China, with Nanking as its capital and Mr. Wang Ching-wei as acting-president, began at 9 o'clock local time in Nanking on March 30 and ended without incident one hour later.

Besides Mr. Wang Ching-wei, among more than 200 officials of the new régime who attended the inauguration were Mr. Chan Kung-po, chairman of the legislative yuan, Mr. Wen Tsung-yao, chairman of the judicial yuan, Mr. Liang Hung-chih, chairman of the control yuan, and Mr. Wang I-ting, chairman of the examination yuan.

Mr. Wang Ching-wei took his seat as head of the régime and the national flag was hoisted in ceremony amid the roar of a gun salute. The national flag of the new régime is the same as that of the National Government at Chungking, except for a distinguishing triangular pennant above it, which bears the motto of the new administration : " Peace, Anti-Communism and National Reconstruction."

Mr. Wang Ching-wei then stood and read from the teachings of the late Dr. Sun Yat-sen, founder of the Chinese Republic, after which the yuan chairman, state ministers and other officials were invested in office.

Mr. Wang again rose and read a declaration proclaiming the new government and Nanking as its capital. He declared his régime to be the only unified national government lawfully representing a sovereign China, in succession to the National Government at Chungking.

The clock struck 10 and the ceremonies ended.

Following the inaugural ceremony, the new régime issued a proclamation announcing that the national government has returned to Nanking in accordance with a decision by the central political conference. It instructed all officers and men to suspend military operations and to wait for further instructions.

The proclamation invited the Chungking Government to participate in the peace movement " to save China from distress and save the situation." It also said all regulations and treaties promulgated by the Chungking Government in the future will be considered void.

A 10-point platform was announced as follows :

(1) The national government, in the principle of good neighborly friendship, will share the responsibility for the establishment of a new order in East Asia and the security of lasting peace and the achievement of complete independence and sovereignty for China through diplomatic negotiations.

(2) The national government will respect the legitimate rights and interests of third Powers and will strive for the promotion of friendship and improved relations with them.

(3) The national government will strive to check Communist activity and others such as tend to disturb peace and order, in co-operation with friendly nations.

(4) The national government will take over pacification forces and local bands of irregulars to organize a national defense force.

It will abolish military dictatorship by drawing a clear demarcation between military administration and command.

(5) Democratic principles will be facilitated through full representation of the will of the various classes of the nation and administration by men of ability.

(6) A national congress shall be convened for adoption of a national constitution and the enforcement of constitutional government.

(7) Investments of capital and technique will be invited from friendly countries for the economic and industrial rehabilitation of China.

(8) Efforts will be made to improve the foreign exchange balance through the expansion of foreign trade. A Central Bank of China will be established for the unification of currency and a solid banking foundation.

(9) Efforts will be made to ease the national burden by the adjustment of taxation and rehabilitation of farming areas as well as by direct relief.

(10) Education will be based on the three principles of anti-Communism, peace and national reconstruction, Education in science will be encouraged.

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PLEDGING support for the new China régime on the occasion of its establishment in Nanking under Mr. Wang Ching-wei, the Japanese Government on March 31 issued a statement declaring it expects third Powers to understand " this solemn reality " and to contribute toward establishment of peace in East Asia.

The declaration says it is natural for Japan to show special concern for development and utilization of resources in China but denies any intention to exclude economic activities of third Powers which conform to the " new situation in East Asia."

Japan wants China to make complete its independence and freedom on a " moral basis," the statement declares, and to co-operate with this country for construction of a new order in East Asia.

As long as pro-Communist and anti-Japanese forces fail to awaken from their " illusory dreams," the announcement concludes, Japan will not lay down its arms and will not relax its determination to surmount all obstacles that may arise in the future.

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CONDEMNING acts of aggression which rob peoples of their political independence, the Secretary of State, Mr. Cordell Hull, indicated that the United States would not recognize the Nanking Government of Mr. Wang Ching-wei, leader of the Nanking Kuomintang. In a statement issued simultaneously with the establishment of the Nanking Government, Mr. Hull said, " The United States, of course continues to recognize the Chungking Government as the Government of China.

" In the light of what happened in various parts of China since 1931," the statement said, " the setting up of the new régime at Nanking has the appearance of a further step in the program of one country by armed force to impose its will upon a neighboring country and to block off a large area of the world from normal political and economic relations with the rest of the world.

" The developments there appear to be following the pattern of other régimes and systems which have been set up in China under the ægis of an outside power and which, in their functioning, have especially favored the interests of that outside power and denied to the nationals of the United States and other third countries the enjoyment of long established rights and equal and fair treatment, which is legally and justly theirs.

" The Government of the United States has noted statements of high officials of that outside power that their country intends to respect the political independence and freedom of the other country and that, with the development of affairs in East Asia, this intention will be demonstrated.

" To this Government, the circumstances, both military and diplomatic which have attended the setting up of the new régime at Nanking do not seem consistent with such an intention. The attitude of the United States towards the use of armed force as an instrument of national policy is well known. Its attitude and position with regard to various aspects of the situation in the Far East have been made clear on numerous occasions.

" That attitude and position remain unchanged. This Government again makes full reservation of this country's rights under international law and existing treaties and agreements.

" Twelve years ago the Government of the United States recognized, as did other Governments, the national Government of the Republic of China. The Government of the United States has ample reason for believing that that Government, with its capital at Chungking, has had, and still has, the allegiance and support of the great majority of the Chinese people. The Government of the United States, of course, continues to recognize that Government as the Government of China."

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THE British Government has repeatedly proclaimed that the only Chinese Government it recognizes is that which is now established at Chungking. It therefore does not feel called upon to reiterate its stand now, after the formation of the Wang Ching-wei Government at Nanking, authoritative quarters declared.

Britain's attitude is unchanged, they stated, she will naturally observe with the greatest care the development of the China situation and Wang Ching-wei's progress in extending his rule over the areas now under Japanese control.

Constant watch will also be kept on the Chinese population's attitude toward the new régime, and the British Government will duly note whether Mr. Wang's actions are dependent upon the Japanese Government or the Japanese military in China.

British interests may compel the British authorities to establish most reserved but correct relations with the local Chinese authorities in the occupied regions, the same authoritative circles declared.

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ITALIAN Government circles refuse as yet to comment on the report by a Japanese news agency which asserted that the Government of Mr. Wang Ching-wei would be formally recognized by Italy. Official quarters declared that Italy was reserving her decision in this matter.

It is, however, recalled that Count Ciano, Italian Foreign Minister, addressed a telegram to Mr. Wang Ching-wei some weeks ago which was published by the Chinese newspapers on January 21. In this telegram Count Ciano after conveying his personal congratulations to him, assured Mr. Wang's Government that Fascist Italy was willing to co-operate with them.

It is pointed out that formal recognition of one Government by another requires in any case certain diplomatic formalities so that an exchange of notes would have to take place if Italy should decide sooner or later to recognize the Government of Mr. Wang Ching-wei.

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A MESSAGE from Rome reports that a press ban has been imposed on the recent statement by Mr. Cordell Hull, American Secretary of State, with the result that not a single Italian paper has published his declaration reiterating the principle of non-recognition with regard to the new Central Government under Mr. Wang Ching-wei.

According to a report from Lima, the Peruvian Government has so far made no formal manifestation of its attitude towards the new régime at Nanking. *Prenza*, an influential newspaper at Lima, however, observed on March 31 that the statement by General Chiang Kai-shek, repudiating the new régime, was a fine one, but that it would possibly remain as a souvenir and have no practical effect on the Central Government.

" The Chungking Government will eventually find it impossible to oppose the strength of Japan, who supports the new Government of China," the newspaper added.

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THE new Nanking Kuomintang Government headed by Mr. Wang Ching-wei is as independent as the government of Manchoukuo, the Japanese Foreign Office spokesman, Mr. Yakichiro Suma, told the press in Tokyo on April 1.

Mr. Suma, in commenting on the statement by Mr. Cordell Hull, American Secretary of State, said the United States should await developments in East Asia before refusing to recognize the new Nanking régime.

" The United States," said Mr. Suma, " should be more patient, and should wait and see developments before encouraging toward further resistance those elements which we are fighting."

Mr. Suma said that Mr. Hull's statement represented the " natural attitude of the Americans toward the China affair," but added that the statement contained three important points.

The first point, Mr. Suma said, is that Mr. Hull makes it clear that the American Government cannot recognize the new Nanking régime, but on the contrary recognizes the Chungking Government with which Japan is in a state of hostilities.

Mr. Suma said that such an attitude on the part of the American Government encourages people or a group of people in keeping up their anti-Japanese sentiments despite the fact that during the Nomura-Grew talks the American Government " made us understand that it was ready to enter into talks with Japan in a constructive spirit."

The spokesman pointed to the American Committee for Non-Participation in Japanese Aggression, headed by Col. Henry Stimson, former Secretary of State, as an example of an organization extending great assistance and encouragement to the Chungking Government.

Mr. Suma said the second point of note was the alleged fact that Mr. Hull's statement ignored " Japan's sincere efforts to ameliorate relations with the United States."

Mr. Hull made his statement, according to Mr. Suma, without regard for the assurances and guarantees given America by Japan and without awaiting the outcome of Japan's " sincere efforts."

Mr. Suma denied Mr. Hull's assertion that Japan is setting up a political and economic bloc in the Far East. He said that present conditions are " only a phase in the transition from hostilities to peace."

The third point of note regarding Mr. Hull's statement, Mr. Suma said was that " we cannot and any country cannot be blind to the facts as they are."

Comparatively speaking, he said the Japanese occupied area of China may be smaller than areas under the jurisdiction of the Chungking Government, and the population of Japanese-controlled areas may be smaller, but substantially speaking, " ninety per cent of the customs revenues of all China will be controlled by the new Nanking Government."

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THE American attitude toward the Japanese policy in China is " presumptuous " the *Japan Times* declared in an editorial comparing the British, and American attitudes as expressed through the two countries' Ambassadors in Tokyo.

The newspaper said that the famous " from the horse's mouth " speech of the United States Ambassador to Tokyo, Mr. Joseph Grew, expressed the " aggravated tone of American public opinion " in regard to Japanese action in China. The American public attempted to sit in judgment on Japan for her action, the newspaper said, without making any commitments themselves.

The impasse in the Far East will continue as long as the American people persist in this attitude, the newspaper declared. The newspaper described the American attitude as " presumptuous to the point of being dogmatic and doctrinaire, in that it pursues its own moral and other principles and closes its eyes to reality."

Although Britain has never become reconciled to Japanese activity in China, the *Japan Times* said, she is " awake to reality and studies the ground for potential means to guard and develop her interests."

" The new National Government of Nanking," the newspaper concluded, " seems an already too important factor to be dismissed with any expression of policy opposed to its principle."

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UNDER the caption " Hull's Statement," the *Japan Advertiser*, American-owned and managed newspaper, comments in a leading article on the American Secretary of State's statement in connection with the establishment of a new régime in China under Mr. Wang Ching-wei.

The statement, the *Japan Advertiser* says, follows the lines of policy laid down long ago, and brings no real change in the situation as regards America's rôle in the Far East.

Unlike former Secretary of State Henry Stimson at the time of the Manchurian affair, the newspaper continues, Mr. Hull did not send a note to Japan but merely issued a statement of the American position.

The last American Note to Japan, the journal adds, was sent over a year ago, and it was indicated then that the United States did not intend to do any more note writing . . . " but legalities aside, the fact is that the Wang Ching-wei régime has come into being, and that it controls, affairs in a large and particularly important part of China, including all China's big ports."

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" SOME third Powers not only still fail to understand Japan's military action in China, but refuse to look straight at realities," declared Mr. Hachiro Arita, Foreign Minister, at a farewell party given in honor of General Nobuyuki Abe, Envoy Extraordinary and Ambassador Plenipotentiary to the Central Government under Mr. Wang Ching-wei, by 100,000 citizens at Hibiya Park.

" Some Powers are pursuing a policy of non-recognition towards the new Central Government of China, and some are going a step further by attempting to thwart realization of Japan's objective in her campaign in China, and to obstruct construction of a new order in East Asia.

" Whatever attitude a third Power or Powers may take, the fixed policy of the Imperial Government will be unshakable.

" It is an important duty imposed on Japan to make the new Central Government grow to an effective and stable government. No grosser miscalculation of the actual situation can be committed than to assume that economic pressure will be sufficient to force Japan to change her fixed policy.

" It is hardly necessary to reiterate that what Japan wants in the China affair is to band together Japan, Manchoukuo and China, actuated by the common objective to build a new order in East Asia and establish good neighborliness, joint defence against the Comintern, and economic co-operation among them.

" It is, indeed, reassuring to see the new Central Government of China set up by Mr. Wang Ching-wei and his associates, who share the aspirations and ideals of Japan, and who mean to go ahead with the realization of those common aspirations side by side with Japan."

Mr. Arita admitted that the new régime, which was very young, was not possessed of sufficient powers, but trusted that patriotism and a firm belief in peace and national salvation, inspiring Mr. Wang Ching-wei and his associates, would move the 400,000,000-population of China, and rally the Chinese masses under their banner before long, thus acquiring real power.

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ALTHOUGH Japan desires third countries to recognize the new China régime under Mr. Wang Ching-wei as soon as possible, the Government has decided to follow a policy of indifference to the attitudes adopted by them, according to the *Nichi Nichi*.

Special significance is said to be attached to a report that both Italy and Spain unofficially have informed the Japanese Government of their intention to recognize the Wang régime in view of the statement by Secretary of State Cordell Hull denouncing the Nanking administration. The paper failed to make clear the nature of this alleged significance.

Formal recognition of the new régime by the Italian and Spanish governments is expected to follow Japanese recognition in the near future. Recognition by Manchoukuo also is held certain, making a total of four countries expected to recognize the Nanking régime.

Meanwhile, Tokyo and Nanking will co-operate in grasping complete control of China, as a result of which third countries will be forced to recognize the new China government in order to protect their rights and interests, says the *Nichi Nichi*.

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IF Generalissimo Chiang Kai-shek reconsiders his anti-Japanese policy and repents, it might be possible that the new Chinese Government at Nanking would co-operate with him in the reconstruction of China, Admiral Mitsumasa Yonai, the Premier, told the press.

Commenting on America's " censorious attitude " toward the Nanking Government, he said he hoped the new régime would gain strength rapidly and become a stable administration in order that such a situation would be established in China as to make it impossible for foreign countries to do anything in China without recognizing it.

The Premier pointed out that third Powers should not fear that their interests would be ousted from China as Japan was determined to keep her promise even if it was an oral one.

He said that third Powers may rest assured that the Yangtze would be opened unless unforeseen circumstances intervene.

Much is to be expected of the new Nanking régime which is in position to increase its armed force by drawing on the large Customs revenues which it will control, Admiral Yonai pointed out.

He said the new régime would launch operations against Chungking to accelerate Chungking's disintegration, while at the same time making every effort to organize military strength.

He charged that Chungking had been shaken by the organization of the Nanking régime and that Chungking's fighting power had dwindled.

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MEASURES for the servicing of foreign loans contracted by China previous to March 30 will be undertaken by the reorganized "National Government," Mr. Chou Fo-hai, Minister of Finance, announced in outlining an eight-point economic program.

Steps to prevent an outflow of Chinese funds as a consequence of the habitual excess of imports over exports would also be taken by the Ministry in co-operation with other governmental agencies, he added. This action would be taken to better the economic status of the Chinese people.

The eight-point program announced by Mr. Chou provides for a stabilization of currency, the maintenance of national credit, a readjustment of taxation, the lessening of the people's burdens, the attraction of capital, a readjustment of trade, regulation of the people's livelihood, and assistance to production.

In undertaking the stabilization of currency, Mr. Chou stated, measures would be taken to unify the various currencies now in circulation.

The servicing of Chinese domestic loans, he continued, would be resumed after complete peace was re-established.

A reduction of various miscellaneous taxes, the attraction of capital by encouraging investments of funds now remaining idle, a better distribution of commodities and the rehabilitation of farming communities would also be sought, he added.

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TOKYO reacted calmly and coolly to the declaration made by the U.S. Secretary of State, Mr. Cordell Hull, when he said that his country would continue to recognize the Chungking Government as the only Government of China. It was admitted, however, that Mr. Hull's statement was stronger than expected.

Many foreign observers in Japan believe that Mr. Hull's statement, instead of causing Japan to soft-pedal her policy, will only be taken by the Government as one more opportunity to strengthen the people in their determination never to accept being stopped by any Western Power but rather to face the economic and other perils which such a stubborn decision may entail.

Japanese circles closely connected with the Tokyo Government are of the opinion that the United States is more and more estranged from France and Great Britain as far as Far Eastern politics are concerned. They hint that Mr. Hull's blow has been deadened by the conciliatory speech delivered a few days ago by Sir Robert Craigie, the British Ambassador to Japan. London and Paris, they assert, are not reacting too favorably to Mr. Hull's statement. Their conclusion is that on the whole, the situation for Japan is not such a bad one, for much diplomatic manœuvring is still possible, with Washington on one side and with Paris and London on the other.

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A BROADER embargo on shipments to Japan, widened to include crude oil, trucks, scrap metal, and other crucial war materials was urged in Philadelphia on March 24 by delegates of 23 American religious denominations who met in a foreign relations seminar held as part of a national study conference sponsored by the Federal Council of Churches.

The conference also recommended that at the same time the government show its desire to be friendly to Japan by offering to conclude a new trade pact on an "average quota" basis under which sales of supplies to Japan would be cut to the average for 1921-31.

Proposals for a "constructive settlement" of the problem of the Far East, it was held, must provide for a China "strong enough to control her own affairs and destiny" and simultaneously for "a strong Japan no less in control of her own destiny."

"A truly independent and strong China," said the resolution, "is essential if she is to avoid encroachments of Russia, of the western imperialisms, and of Japan. No indemnity for American losses in China or renewal of rights of a strictly commercial character, must be allowed to divert attention from this essential point."

"A prostrated Japan," the statement went on, "would inevitably invite encroachments from Russia and possibly retaliation from China. Japan's pressing economic problems and needs must be recognized and adequate provision must be made to meet them."

A suggestion that the Christian people of America be urged to participate in a voluntary boycott of Japanese goods was tabled. Signers of the statement included Mr. Richard Wood of the Friends Peace Committee; Mr. Linley Gordon of the Church Peace Union; Mr. J. Henry Carpenter of the Brooklyn Church Federation; Mr. James A. Crain, executive secretary of the United Christian Missionary Society, and Miss Dorothy Detzer of the National Committee of Church Women.

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As military operations subside in China, it may be possible to make the United States recognize the new situation in East Asia, and this possibility precludes the idea that relations between Japan and the United States are bound to become aggravated, Foreign Minister Hachiro Arita declared in replying to an interpellation from Mr. Ichiro Kano, who asked, among other questions what is keeping the Government from making known to the public that there is a grave crisis in Japanese-American relations.

"The Chiang Kai-shek régime," the questioner said, continues to exist. This may be attributed to the assistance which third Powers are giving to it. I want the Government to make clear the third countries that are giving aid to it, and I want it to make clear the relations between the Chungking Government and the United States, which is giving more assistance than any other Power. I also want enlightenment on points on which the Far Eastern policy of the United States clashes with the Japanese policy for disposal of the China incident.

"There is need to have the future policy of the United States toward Japan made clear. I wonder how the Government looks on the increasing armaments of America. There is need also for the Government to clarify the policy to be followed by it in coping with the economic pressure which the United States is bringing to bear on Japan as a result of the termination of the Japanese-American treaty of commerce and navigation.

"Is the Government prepared to meet the worst possible development between Japan and the United States? What prevents it from making known to the people that there is a grave crisis in Japanese-American relations? Is there no intention to take positive action toward America for the sake of building the new order in East Asia?"

The Foreign Minister replied:

"Some third countries are following a policy of helping the Chiang régime. Others have formal diplomatic relations with it. All of them are aiding it directly or indirectly. By doing so they are both gaining profits for themselves and giving benefits to that régime. Direct and indirect acts of assistance include the supplying of arms and munitions and the granting of commercial loans.

"Some of these countries are granting loans to China while denying them to Japan. All these acts may be considered acts of assistance to the Chiang régime. The public already knows the Powers that are giving such assistance.

"As for relations between the Chungking Government and the United States, there is the fact that the United States recognizes the Chiang régime. This probably explains why it is aiding the régime indirectly in the field of trade. The recent grant of a $20,000,000 credit is one of the American acts of indirect assistance. It may be that the United States thinks that something may be said in favor of aiding the Chiang régime while refusing it to Japan.

"As far as Japan is concerned, the giving of aid to the Chiang régime and the denying of it to Japan is an act of assistance to the Chiang régime. It is true that the Americans are mistaken in thinking that Japan is bent on driving their interest out of East Asia. It also is true that the United States takes every opportunity that offers to insist on the open door.

"Japan's views on the new order in East Asia and the principles of the open door and equal opportunity are as have been stated repeatedly in the past. There are military operations in progress in China on a large scale. This is one reason why we are unable to make the Americans understand the real intentions of this country

in any complete sense. I trust, however, that with the gradual diminution of these military operations it will be possible to make the Americans recognize the new situation in East Asia.

"These considerations preclude the thought that relations between Japan and the United States are bound to become aggravated. I think that we must renew our efforts to increase the knowledge of the United States regarding actualities in East Asia."

To the same interpellation, the Premier replied :

"To judge by the action of the United States in terminating the Japanese-American treaty of commerce and navigation, that country is pursuing an anti-Japanese policy as a result of its ignorance of the real intentions of this country. It would seem to fear that its interests in China will be forced out in the event of a new order in East Asia. This fear, coupled with the perfunctory legal way of thinking peculiar to the Americans, is behind the policy pursued against this country by the United States.

"The anti-Japanese attitude of the United States Government arises from its lack of understanding of Japan's true intentions. It is up to Japan to make greater endeavors to induce the United States to understand its intentions."

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THE Japanese military blockade of the British Concession in Tientsin, enforced since last June, is expected to be withdrawn before long as a consequence of final agreement between the British and Japanese Governments on the disposal of the Chinese silver in the British Concession, which is now awaited in Tokyo.

Although final agreement on the silver question was reported by Domei and all Japanese newspapers it is learned that the British Embassy at Tokyo is still awaiting instructions from London on a tentative settlement said to have been reached on March 4.

A meeting between the British Ambassador, Sir Robert Craigie, and Foreign Vice-Minister Masayuki Tani apparently inspired the belief that the entire matter had been settled.

On the basis of the tentative agreement, said to call for joint custody of the 14,000,000 yuan in silver bullion of the Chinese National Government now resting in the vaults of the Chinese Bank of Communications in the British Concession in Tientsin, it is expected that negotiations will be started with the French Government for similar stewardship of the 26,000,000 yuan in silver specie held in the Bank of China in the French Concession, according to Domei.

Under the reported Anglo-Japanese agreement, 4,000,000 yuan of the silver will be used for the relief of impoverished Chinese civilians in North China, and the balance will remain in the vaults below the British consulate, under seal.

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INCLUDED in the far flung diplomatic activity which Britain is expected to undertake in the coming days may be the settlement of certain Anglo-Japanese controversies, well-informed sources disclosed in London.

Barring accidents, the ten-month old Anglo-Japanese dispute regarding the Tientsin silver question may be adjusted informed quarters predicted.

Out of the £800,000 worth of China's silver in the British Concession in Tientsin, £100,000 would be devoted to flood relief in North China and the remaining £700,000 would remain in the Chinese Bank of Communications, sealed and for all practical purposes "sterilized," it was predicted.

Japan's part in this arrangement, if it is concluded, would presumably be to remove the Japanese blockade of the British Concession in Tientsin, well-informed circles said.

Japan is anxious to avoid British interference in Japanese-Dutch East Indies trade, it was pointed out. If Japan undertakes to ration herself by refraining from re-exporting rubber and other commodities to Vladivostok from where they can reach Germany, Britain will probably agree to keep her hands off Japanese commerce in the East Indies, it was believed.

Japan is also seriously attempting to assure herself of a steady wool supply, for which she is now constrained to go mostly to London, since Britain bought the entire Australian wool crop.

▣ ▣ ▣ ▣ ▣

PENDING issues between Japan and the Soviet Union have reached an impasse since the beginning of the current year as progress in Soviet-Japanese trade parleys have come to a standstill, declared the *Japan Times* reviewing the situation between the two countries.

Although a prospect of reaching an agreement with the Soviet Union on a number of pending issues was hoped for earlier in the year, the outcome has shown complete failure, the paper said.

The mixed committee of representatives from Japan and Manchoukuo on the side and the Soviet Union and Mongolia on the other who were appointed to settle regional demarcations around the Nomonhan border district, came to no agreement and wound up business in January, leaving all border questions unsettled.

With regard to the demarcation along the Soviet-Manchoukuo frontiers, the two countries agreed in principle to set up committees and enter into negotiations with the object of settling their disputes, but the theory has not been put into practice.

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JAPANESE army commanders in northern Manchoukuo are rushing work on defence works against the Soviet Union "in view of the characteristics of the border provinces," according to Japanese reports from Heiho.

The special budget of the Manchoukuo Government for the development of the northern districts in 1940 totals 3,181,000 yuan. Of this the State Council will receive 309,000 yuan, the Department of Public Peace 386,000 yuan, the Department of Peoples' Welfare 138,000 yuan, the Department of Industry 237,000 yuan and the Department of Communications 2,119,000 yuan.

The report indicated that the Japanese army is concentrating on the development of a modern communications system throughout the northern border areas as one of the major projects of the defence program for the area.

The 1940 budget is 1,024,000 yuan above the budget for last year.

"This budget," said Japanese reports, "was drawn up with the object of adjusting the national defence system rapidly in view of the characteristics of the border provinces. This budget will be apportioned for the protection of the frontier, the development of communications, agriculture, stock raising, settlement and the promotion of education.

▣ ▣ ▣ ▣ ▣

THE acute food situation in North China is expected to be relieved shortly following completion of arrangements for the importation of huge quantities of flour from Australia, Japan and Manchuria.

No less than 3,287,000 bags of flour are expected to be available for the North China populace within the next couple of months.

Of this amount, 1,000,000 bags will come from the British and French concessions in Tientsin, the authorites of which are reported to have agreed to their removal following negotiations with the Chinese authorities.

Tientsin recently received 63,000 bags of Japanese flour, while Peiping is expecting 750,000 bags of Australian flour, 300,000 bags of Japanese flour, and 300,000 bags of flour from Manchuria within the next two months. In addition 74,000 piculs of oats will be shipped from Honan and Shansi to be made into flour in Tientsin and Peiping.

Reports from central Hopei state a famine exists in that province, and major tragedy looms as the people are already at starvation level.

Some of the population are said to be living on the bark of trees and eating earth, which has caused many deaths.

The desperate shortage of food has even caused peasants to up-root their wheat stalks, thus spoiling the spring crop.

Conditions are especially bad around Paotingfu, while the whole district between Paotingfu and Tientsin, it has been ascertained, is an area of famine, still inundated with last year's flood waters.

The people in these areas have to find means of living, without garnering fresh crops, until September.

The number facing starvation, following last year's flood, was 3,000,000 in the province of Hopei, and 1,000,000 in the province of Shantung.

About 12,500 villages have been devastated in Hopei, and 5,000 in Shantung. It is probable that conditions will become worse, reaching a climax in the spring, as an increasing number of people are threatened with disaster.

Tea Leaves from Lo Pat's Garden

by Shamus O'Rabbitt

The man whose heart
Is most full of generosity
Oft has the emptiest pockets.

♦♦♦♦♦♦♦

A hearty hand shake
Square look in the eye
A cheery and considerate word
Oft denote a more generous soul
Than is possessed by a croesus
Famed for his Philanthropy.

♦♦♦♦♦♦♦

It is easy to admit the soundness
Of a philosophy
Which makes us appear virtuous.

♦♦♦♦♦♦♦

If men were judged among men
By their conduct at home
What a wonderful day it would be
For their wives!

♦♦♦♦♦♦♦

It seldom occurs to the quixotic hero
That the wife may be a good subject
For the practice of heroism.

♦♦♦♦♦♦♦

♦♦♦♦♦♦♦

A man's idea of fifty-fifty on the income
is
Wife—
Home, children, clothes and trouble—
Self—
Clubs, sports, gaiety and friends.

♦♦♦♦♦♦♦

A "free country" is where individuals and groups
Are free to enact laws that encroach upon
The freedom of others—
A "free man" is one who holds
That he is free to do as he pleases
And that his wife is free to agree.

♦♦♦♦♦♦♦

Regrets which are commendable
Are those for lost opportunities
To do a favor for a friend.

♦♦♦♦♦♦♦

To decide to have no regrets
Is to determine to pay the price of folly.

♦♦♦♦♦♦♦

The pleasure we derive from acts
Is not from the acts only
But from the sum of all the joys plus
Anticipation—
Minus remorse—
Blessed is he who hath no regrets.

♦♦♦♦♦♦♦

It is cowardly to have regrets
For the pleasures taken from life.

♦♦♦♦♦♦♦

Sleep is the salary of life
And must be earned by exercise.

♦♦♦♦♦♦♦

We are prone to attribute a good sleep
To a clear conscience
Without considering that
The composure produced by sound sleep
Is conducive to the wise actions
That earn a clear conscience.

♦♦♦♦♦♦♦

If we should punish ourselves
For remaining awake nights
By leaving unsaid
Those things we should not have said,
Or,
By writing that deferred letter
To our mother-in-law—
We would soon learn to keep our eyes shut.

♦♦♦♦♦♦♦

Children soon lose their respect for those
Who confuse age with wisdom.

♦♦♦♦♦♦♦

Only children and philosophers are victims
Of Pure Reason.

♦♦♦♦♦♦♦

If those who harbor hate in their hearts
Could have a register
Of its destructive influence
On their souls—
And the lives of others—
The vision
Would make them seek the shelter of Love

Far Eastern Uncertainties

By C. J. LAVAL

A NEW government has arisen in China at Nanking repeating the historic pattern under which the distracted land of Cathay again is divided under two régimes. The points of the compass have been shifted in this latest development, for whereas twenty years ago the country had a Northern Government and a Southern Government, the opposing régimes of this day are in the East and the West. In the earlier dispensation China's Northern Government enjoyed the recognition of the United States, Great Britain and other Occidental powers as the legal government of the country. In a short time, however, the Southern Government conquered and absorbed the Northern régime, inheriting then the recognition of the Western powers that earlier had been denied. The favor of recognition from the Western powers to-day is bestowed on China's Western régime, the Government at Chungking, which is ruled by General Chiang Kai-shek and those who support him.

Wang Ching-wei, who is at the head of the newly organized Government in the East at Nanking, was, up to about a year ago, second in command of the western Government at Chungking. His withdrawal from that government grew out of a conflict of opinions on the issue of whether China should continue fighting or should make peace with Japan. When the conflict between China and Japan had been in progress a little more than a year Prince Konoe, then Premier of Japan, announced a list of terms under which Japan was ready to end the hostilities. These peace terms by any ordinary international standards were regarded by many as exceedingly liberal. At that time the Chinese armies had been driven into the hinterland and the Japanese held the coast, the main routes of transport and the great ports of the country. Prince Konoe asked for no territory and no indemnity in a peace in which the territorial and administrative sovereignty of China would not be impaired, and he offered Japan's good-will and co-operation in the economic rehabilitation of the country.

China under the Chiang Kai-shek Government had gone into the conflict in July of 1937 in armed alliance with and at the behest of leaders of the Communist armies in China, who take their orders from the Comintern in Moscow. Russia, the traditional enemy of Japan, following the historic Russian purpose to win an ice-free port on the Pacific, obviously could see advantages in a conflict in China calculated to drain the armed strength of Japan. It follows that the offer of any peace terms from Japan, however liberal and advantageous, to a Chinese Government in alliance with Communist forces and subject to Russian influence, would be rejected. When this happened Wang Ching-wei quit the Chungking Government and as a means to end the wartime sufferings of his fellow countrymen proclaimed his willingness to negotiate with the Japanese to end the hostilities under the terms that Prince Konoe had offered. This development was in consonance with Japan's desire to bring an end to the warfare and the Tokyo Government then gave full support to the peace movement in China.

The Question of Recognition

It is to be expected, therefore, that presently the new Nanking Government will receive formal recognition from the Government at Tokyo, which, in fact, already has appointed an Ambassador to the Nanking régime in the person of General Nobuyuki Abe, the former Premier.

"Japan's consistent efforts," General Abe declared in a recent address on the eve of his departure for China, "are directed at nothing else than to promote neighborly amity between China and Japan, and to bring lasting peace to East Asia."

Indications have been given that the new Nanking Government also will be accorded recognition by Italy, Spain and Germany, but definite assurances of such action by these powers has not yet been officially announced. While the great democracies of the United States, Great Britain and France all are withholding recognition of the Nanking Government, a disparity of viewpoint has developed among these powers regarding affairs in China. As happened immediately after the Manchurian incident of 1931, the American State Department has leaped into a place of leadership while Great Britain and France diplomatically are lagging behind. On the day after inauguration of the new Nanking Government the American Secretary of State, Mr. Cordell Hull, issued a lengthy and impressively vehement pronouncement reiterating that the United States continues to recognize the Chungking Government and expressing distrust of the new Nanking régime.

Various British statesmen have declared in recent months from time to time that no change is taking place in British policy in China, and in reply to questions in the House of Commons after the inauguration of the new Nanking Government, Mr. R. A. Butler, Under-Secretary of State for Foreign Affairs, re-affirmed that Britain continues to recognize the Chungking Government in China and will not recognize the new Nanking Government. Somewhat in contrast with these views expressed at London, in an address at Tokyo that was delivered on the eve of the inauguration of the new Nanking Government and just three days before Secretary of State Hull issued his statement, Sir Robert L. Craigie, the British Ambassador to Japan, said: "Truth will out, and already there is growing up in each country an appreciation of the extent to which the actions of the other have been villified and misrepresented during these last years." In his address the British Ambassador did not touch on the subject of recognition or non-recognition of the new Nanking Government, but he added that, "bearing in mind the declared intentions of the Japanese Government, and the measure of success achieved, I have a definite feeling of confidence in the future of Anglo-Japanese relations."

Characteristically the French viewpoint regarding the new Nanking Government is discreetly moderate. The semi-official *Le Temps*, in Paris, observed that "there will be no great change in the China situation while the new Nanking Government is not recognized and the Chungking Government continues to be recognized. Nevertheless, it may be stated right now that the creation of this Nanking Government is a new fact that must be noted, and that it is the outcome of large-scale Japanese diplomatic efforts coupled with vast military operations."

New Factor in Situation

The German menace that impends over Holland, following the thrust into the Scandanavian countries, has increased British and French preoccupation in Europe, but it has had the effect also of shifting American attention back into the Far East. This American interest for the moment is centered on the Netherlands East Indies and on possible action Japan may take in the event that the Netherlands East Indies' home government falls under German control. The Japanese Foreign Minister recently said it would be a matter of great concern to Japan should European events bring about a change in the status of the East Indies, and the Spokesman of the Foreign Office intimated that the Foreign Minister's statement foreshadowed possible early action in connection with the East Indies. The semi-official *Tokyo Times* observed in this connection that "the domination of the Netherlands East Indies by any major western power would force Japan to revise her 'non-involvement policy' regarding the European war. Putting the matter plainly," this newspaper added, "if the powers involve the Netherlands East Indies in the war, Japan may be involved. Any change in the status of Far Eastern possessions of Western powers as a result of the war must be carried out only with the full consent and concurrence of Japan. Any attempt to ignore this principle will obviously involve a revision of Japan's policy of non-involvement."

All the broad indications with regard to the vexed situation in China and its newly formed Government at Nanking, and the latest development extending into the Netherlands East Indies, give the impression that the European democracies desire greatly to "let George do it" in the Pacific, George in the case being the American Government. Signs that "George" is setting out to

assume the responsibility are to be seen in the recent additional American loan of U.S.$20,000,000 to China, in Secretary of State Hull's statement concerning the new Nanking Government, and also in reported shifts of American warcraft into south Pacific waters near Java.

The disposal of American warcraft following the large scale naval manœuvres that began April 1 in the Pacific based on Pearl Harbor, Hawaii, has not been officially disclosed. It was intimated at Washington that these American naval war games might this year be extended as far as Samoa and the Philippines, thus setting aside the traditional tacit Japanese-American understanding regarding the 100th degree of longitude. In answer to sharp criticisms of American naval activities made by Japanese spokesmen and charges in the Japanese press that the United States was "brandishing a big sword" at Japan in the naval manœuvres, Mr. Charles Edison, American Secretary of the Navy, denied that the naval exercises were in any way a threat to Japan.

Significant Contrasts

Viewpoints clearly are at variance on different sides of the Atlantic regarding the situation in China and Far Eastern affairs in general. The American attitude toward this situation appears to be harshly uncompromising, and while the strain in relations between Japan and the United States seems to be growing more intense, Anglo-Japanese relations in contrast are growing easier with even an undertone of friendliness appearing here and there in diplomatic exchanges and in utterances of British and Japanese statesmen. This growing concord is reflected in such things as the swift adjustment of Anglo-Japanese differences over such things as the *Asama Maru* affair, in speeches of the British Ambassador in Japan, and in recurring reports that a mutually satisfactory arrangement is being reached regarding the situation at Tientsin where the Japanese blockade, it is expected, soon will be lifted. Having gone so far as he has already gone in emulation of Col. Henry L. Stimson, his predecessor in office, Secretary of State Cordell Hull may find cause some time in the future to go a step farther, and write a book, as Colonel Stimson did, about Far Eastern affairs, and set forth in his book, as did Colonel Stimson, how American diplomacy in the Far East was let down by British statecraft.

American opinion has long been solidly opposed to any foreign adventuring or involvements along imperialistic lines. So long as this attitude is sustained, present-day American policy in the Pacific can produce only abstract values. The possibility of any concrete gain is excluded. If the policy succeeds completely, and Japan is defeated by China, or is thwarted in her aspirations, then our present irritation with the Japanese merely will be shifted into a new direction against the Chinese. Let doubters study the traditional ways in which these two Asiatic peoples do business. It may be remembered, too, that when the recognized Government of Chiang Kai-shek was but three years old it had set actively about unilateral denunciation of treaties, abolition of extra-territoriality, restoration of foreign concessions and a general all-round uprooting of foreign interests and influence. Those who think that the hundred and fifty-odd American commercial enterprises in China could survive the onslaught of a rejuvenated China are simply believers in miracles.

The odds are all against the ultimate survival of the recognized Chungking Government. The development that would appear to be most desirable in the interests of the people of China would be some form of union of eastern and western governments in which destructive warfare would be ended and the question of recognition by western powers could be adjusted. The Russian factor is the main obstacle, for no union between the Nanking and Chungking régimes can be possible without the elimination of Communism.

How Much Can and Will Russia Aid Germany?

By BRUCE C. HOPPER

(Foreign Affairs)

(The writer of this article, who is Associate Professor of Government in Harvard University, formerly resided in Shanghai and was a special writer for The China Press when that newspaper was under American control. He is an outstanding authority on Russian affairs and is author of Pan-Sovietism and other works).

* * *

How much can Soviet Russia aid Germany? How much will she? The precise answer to this double-barrelled question, which may well determine the military outcome of the European war and the future course of world politics, is still unknown. Current estimates, in so far as they are not guesswork limited to specific items (e.g. oil), are based on the inadequate and often unreliable statistics of Russia's past economic performance. Russia's potential performance is contingent upon many political intangibles yet to be revealed, and upon such factors as the undetermined capacity of Germany to supply equipment and large-scale technical assistance for the reorganization of Soviet industry and transport. Information upon which to base final judgment is inaccessible. Nevertheless, so long as Germany and Russia continue to execute in good faith their treaties of 1939, speculation will be in order. For in the conduct of the war, and in any political action looking towards peace, the Allied Governments must use as a key reference some estimate of the nature, extent, and effectiveness of the Nazi-Bolshevik co-operation.

Many variables are important in the reckoning: the type of war in the West—whether it remains a siege or develops big offensives which would increase Germany's expenditure of war materials; the length of the war—for Russia's capacity to supply Germany will increase with the passage of time; possible political shifts in the lineup—for certain ones might close certain routes between Russia and Germany (e.g. via Rumania and the Balkans); and, most of all, the variable of Russia's willingness to sacrifice domestic requirements of the Third Five Year Plan in order to help Germany gain victory, or a stalemate, in the West.

I.—Germany's Deficiencies

Germany's imports in 1938 totalled 63 million tons. According to a British estimate, this total figure will be reduced 45 per cent by the blockade.* There follows an analysis of Germany's more important deficiencies as created or aggravated by the blockade.

(1) *Foodstuffs.*—The 1939 harvest of grain will be sufficient to supply the population with bread for the present. Germany has accumulated a war reserve of grain, partly surplus from the bumper crop of 1938, partly imported. This reserve is estimated by experts to be sufficient for an additional ten months' supply of bread. The Government may decide to keep this reserve intact against the possibility of a bad harvest in 1940, or may assign part to the feeding of live stock as a temporary remedy for the fodder deficiency.

German imports in 1938 included 137,507 tons of meat, about half from South America, and 229,296 tons of fish, from Britain and Scandinavia.† Fishing has been greatly reduced in the war zone. Russia can supply Germany with neither meat nor fish.

Germany's most serious food shortage, as during the last war, is in fats. In 1938, the import of lard was 42,016 tons, and butter 92,291 tons, mostly from Germany's immediate neighbors,† and

*Professor H. C. Hillman in the *Manchester Guardian*, October 19, 1939.

†Department of Commerce, Bureau of Foreign and Domestic Commerce, "Geographical Distribution of German Imports for 1938 and 6 Months of 1939." October, 1939.

therefore affected by, but not cut off by, the blockade. For fats, Germany has relied on vegetable oils, of which there has been a constant decrease in imports since 1929. The following table gives imports in this category for the year 1937 :*

Peanuts	288,000 tons, containing	42-50 per cent oil,	132,480 tons of oil
Copra	210,000 tons, containing	60-70 per cent oil,	136,500 tons of oil
Soya beans	610,000 tons, containing	20 per cent oil,	122,000 tons of oil
Linseed	180,000 tons, containing	32-43 per cent oil,	68,400 tons of oil
Oil Cake	110,000 tons, containing	10 per cent oil,	11,000 tons of oil
		Total	470,380 tons of oil

Manchurian soya beans, containing 19.8 per cent crude fat and 48.9 per cent crude albumen, could meet the fat deficiency if they could be sent to Germany via Russia in sufficient quantities. From 2,351,900 tons of soya (more than half the Manchurian crop), Germany could extract the same amount of vegetable oil she got from divers sources in 1937.

(2) *Feedstuffs.*—The German shortage in fodder crops, as in foodstuffs, is a repetition of 1914-18. In recent years, a main item among feed imports has been corn—1,895,421 tons, for example, in 1938, 90 per cent of it from the United States and Argentina. An increase in the Russian acreage under barley and rye would permit Russia to supply some feedstuffs, after a year's notice to the State Planning Commission in Moscow. German newspapers recently reported that one million tons of barley were expected from Russia. If this amount actually arrives, it would partially replace the corn item.

Germany's 1939 potato crop is reported as unusually large, 54½ million tons, of which only one-fourth is considered necessary for human consumption. Potatoes are also fed to hogs. A large part of the harvest also is used for the distillation of potato alcohol : and the residue from this process is used for cattle feed. Indeed, potatoes are the staff of life for man and beast in blockaded Germany, the only unrationed food. But even with an abundance of potatoes and a considerable barley import from Russia, the deficiency in fodder will be serious.

(3) *Oil.*—In 1938, Germany imported oil as follows : †

Crude oil	777,840 tons
Gasoline	1,357,102 tons
Diesel oil	1,467,568 tons
Lubricants	388,034 tons
Fuel oil	405,690 tons

Of this import, 80 per cent came from North and South America. Rumania supplied 429,362 tons, and Russia only 33,154 tons. Germany herself produced 2,600,000 tons. Her wartime needs in oil are estimated at 12,500,000 tons (or more, depending on the type of war), of which nearly 10,000,000 would have to be imported. Under the most favorable circumstances, short of German seizure of Rumania's wells, that country cannot be relied upon for more than 2,000,000 tons. Can Russia supply the remaining 8,000,000 tons ?

It should be noted that restrictions within Germany qualify estimates made on the basis of peacetime consumption. The private consumption of gasoline has practically ceased. German industry has greatly favored the Diesel engine, which uses the heavy oils made from coal. By the law of 1931, gasoline in Germany is mixed with potato alcohol up to a maximum of 30 per cent. The potato harvest therefore enters into the calculation of Germany's oil needs. Also, the German strategic railways, improved by the Nazis with new unloading platforms and ramps in the past two years, are adequate to keep the Siegfried Line supplied. Fewer oil-consuming motor trucks are therefore required than is usual in a modern army. Finally, among the qualifying factors is the war reserve of oil, the size of which cannot be ascertained.

(4) *Iron Ore.*—In 1937, Germany imported 20,600,000 tons of iron ore, with a pure iron content of 9,900,000 tons.‡ Of this pure iron, 39 per cent is unaffected by the blockade. Possibly Germany might obtain ore for an additional 220,000 tons of pure iron from Norway and Greece. Sweden supplied Germany with 8,992,331 tons of iron ore in 1938 ; but the former route for bringing the major part of the Lapland ore to Germany (via Narvik, on the North Atlantic) is cut off by the blockade. Chief reliance must, therefore, be on the Baltic ports of Luleaborg, which is icebound for nearly six months, and Oxelösund, further south. It is considered possible that within a year's time the iron ore shipments from Sweden to Germany via the Baltic ports may be increased by 1,800,000 tons. With such an increase, Germany might be able, by the end of next year, to obtain 48 per cent of the pure iron which she acquired by import in 1937.

Germany's own production of iron ore in 1937 was 9,792,000 tons, with a pure iron content of 2,759,000 tons.‡ In 1939, Germany added the iron ore of Upper Silesia to her internal supply, but lost the use of the Saar iron and steel plants which relied on the iron ores of Lorraine (the import from France in 1938 was 5,050,121 tons). The Hermann Goering Werke have not yet reached capacity production, although the German press reports that two new blast furnaces have been put into operation since the outbreak of the war. The use of low-grade German iron ore requires much greater quantities of coke, and the transport of this offers one of the serious problems in increasing production.

The amount of iron ore and iron scrap in the war reserve is unascertainable. During the last two years Germany greatly increased the import of scrap iron (1,164,068 tons in 1938) ; and she acquired additional reserves through salvage in the parts of Poland devastated by the war.

A final factor to be noted is that Germany's overseas export of iron and steel products in 1937 is calculated to have contained one million tons of pure iron. Since this overseas export is barred by the new British and French blockade, we may assume that Germany either can reduce her needs for imported iron ore by an equivalent amount or can apply the savings to the manufacture of the machinery and equipment desired by Russia and the Balkan states.

(5) *Manganese Ore.*—In 1938 Germany imported 425,785 tons of manganese ore, of which 60,925 tons came from Russia ; § the rest is cut off by the blockade. As the Russian manganese ore is 35 per cent pure manganese, instead of 50 per cent as in the ore supplied by other countries, 720,000 tons will have to be imported from Russia to meet the deficiency.

(6) *Non-ferrous Metals.*—Germany's imports in this category in 1938 were as follows :¶

Copper (crude, 272,400 tons ; ore, 653,931 tons)	926,331 tons
Lead (crude, 75,327 tons ; ore, 141,288 tons)	216,615 tons
Zinc (crude, 74,935 tons ; ore, 185,003 tons)	259,938 tons
Tin (crude, 12,090 tons ; ore, 6,142 tons)	18,232 tons
Aluminum	14,521 tons
Nickel	3,984 tons
Chrome (ore)	176,406 tons

Practically all of these imports have been cut off by the blockade, with a consequent effect on the munitions industry. None of them can be supplied by Russia. Zinc can be obtained from Poland ; copper, lead and bauxite from Jugoslavia ; chrome from Greece ; and so on—but not in sufficient quantities. The storage of copper is probably considerable ; in recent years, copper fittings in buildings have been expropriated by the Reich Government.

(7) *Other Needs.*—Other items on the list of German deficiencies are the 250,037 tons of raw cotton imported in 1938 ; 91,918 tons of crude rubber ; also the rarer metals, uranium, molybdenum, antimony, tungsten, etc.—all of which are cut off by the blockade. But in Austria, Germany has nearly 70 per cent of world production of magnesite.

II.—Russia's Capacity to Supply Germany's Deficiencies

Any reckoning of Russia's capacity to supply German wartime needs must take several broad considerations into account.

First, by means of the industrialization process of the last decade, Russia has ceased to be a large-scale exporter, and (thanks to an increasing gold production) is no longer forced to export foodstuffs and raw materials in order to pay for needed imports of machinery.

Second, Russia is a competitor in the world market for many war metals, rather than a potential supplier of Germany.

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*Cf. *Statistisches Fahrbuch, 1938* ; also George S. Jamieson, " Vegetable Fats and Oils." New York : American Chemical Society, 1932.

†Department of Commerce, *op. cit.*

‡*Statistisches Fahrbuch, 1938.*

§Department of Commerce, *op. cit.*

¶Department of Commerce, *op. cit.* (Note : a dispatch from Berlin, *New York Times*, November 12, 1939, gives the import of copper in 1938 as 1,012,300 tons).

Third, Soviet policy, since 1936, has been to supply domestic needs and to lay up reserves for the four Defense Commissariats (Aviation, Shipbuilding, Munitions, and Armaments).

Fourth, Soviet economy is in a permanent state of mobilization for defense, without idle productive capacity, therefore not immediately capable of the Herculean task of an export offensive, even under German management.

(1) *Russia's Surplus.*—Under the circumstances of socialist defense economy it is not realistic to speak of great surpluses of anything in Russia, despite the vast, unexploited mineral wealth. But the prospects of increasing the immediate Russian supply may be summarized roughly.

The Russian grain crop averages close to 100 million tons a year, but there is none to spare for export. Should the war last for several years, Russia could meet Germany's deficiency by increasing the sown area. Meanwhile, the Polish surplus of wheat and rye is already available to Germany. The situation is quite otherwise in regard to fats. Butter and eggs almost disappeared as Soviet export items in 1936. The export of vegetable oils is matched by the import. The livestock herds are being gradually replenished from the low level existing after the wholesale killing of cattle by the peasants in 1930, but there is no fodder for export. Russia might increase barley production and thus partially meet Germany's deficiency in feed for hogs.

Russia, in 1938, produced a one per cent surplus of iron ore; the figure could be raised in order to supply Germany, given two years to work out the planned increase. The production of manganese ore—3 million tons, one-third of it surplus—likewise could be increased on need. It should be noted, however, that the best results in the making of steel are obtained by mixing manganese ores from various sources. How German steel will fare on Russian manganese alone remains to be determined.

Russia's supply of non-ferrous metals is inadequate for her own needs. Russian production meets the domestic needs for copper by only 62 per cent, lead 76 per cent, nickel 40 per cent, zinc 96 per cent, aluminum 87 per cent, mercury 94 per cent, tin less than one per cent.*

Germany's shortage of timber and lumber can be met from Russia's supply of standing timber (available after some effort). Shipments could go forward via the Baltic-White Sea Canal during the summer months.

Russia's cotton crop in 1939 was the largest in her history, but the domestic textile industry takes practically the total; only 3,600 tons were exported in 1938 (11 months). Rubber is likewise unavailable.

The Soviet output of oil last year was 30,000,000 tons, of which 90 per cent came from the Caucasian fields at Baku and Emba. The export has declined in the last decade from 6,000,000 tons to 1,231,000 tons, indicating increased home consumption with the advance of industrialization. In fact, domestic requirements have almost overtaken production capacity in oil. Frequent fuel shortages are recorded by the tractor stations serving collective farms. Of the 27,000,000 tons of crude oil refined in 1938, Russia consumed at home 21,750,000 tons, leaving a surplus of 5,250,000 tons, of which three quarters went into the war reserve, some of which might be shipped to Germany.

(2) *Can Russian Production Be Increased?*—From the above it would seem that the only key supplies readily available in Soviet Russia for export to Germany are timber, manganese ore, oil, and possibly, in time, some iron ore. The question arises as to the possible increase of production through the reorganization of Russian industries by German engineers.

In 1930-32 there was worked out a vast scheme of reorganization of Soviet industries and transport, under which Germany would supply machinery, rolling stock, technical assistance, and credit approximating two billion marks ($800,000,000). This undertaking was interrupted by the events which placed Hitler in power; the Nazis, in fact, collected payment from Russia for equipment previously advanced, including 500,000,000 marks ($200,000,000) in gold. In the interim since 1934, when the German engineers returned to the Reich, there have been serious breakdowns and much sabotage in the Soviet plants. One of the reasons given for Stalin's rapprochement with Hitler was his urgent desire to get German experts back into Soviet plants, along with the necessary replacements for German-installed machinery.

On the other hand, German industry has been working at top speed for war needs. It also has suffered from lack of repairs. Just how much energy it can devote in wartime to supplying the Russian need for machinery remains to be demonstrated. Likewise, given the demand for skilled labor in the Reich, we cannot determine from the outside how many technicians can be spared for the Russian assignment. During recent years, however, one section of Germany's production plant has been working mostly for export. This factor acquires additional importance following recent British and French orders to blockade Germany's overseas exports. This means that German industry should be able to divert more plant capacity to work for Russia, Italy, the Balkans, and even Scandinavia. The one clear fact seems to be that the current Russo-German negotiations, in execution of the Trade Agreement of August 19, 1939, and the subsequent Molotov letter, involve revival, on an even larger scale, of the 1930-32 scheme for German reorganization of Russia's entire industrial and transport systems.

III.—Russia's Capacity to Deliver: The Transport Difficulty

If we assume that with the aid of German engineers the Russian production of oil, iron, manganese, and timber could be increased to supply Germany's wartime demand, the problem would then be one of delivery. This is a key matter in the whole discussion.

(1) *Soviet Railroads.*—The railway system, the weakest link in Soviet economy, is organized for internal distribution rather than for export services via the ports. The general problem in new construction has been to build trunk lines between the production centers (e.g., between the coal and iron fields and the steel mills) and to double-track the existing lines.

The Soviet Government inherited 58,549 kilometers of first track from the Tsarist régime, which they increased by 1938 to 86,500 kilometers; and they added 26,900 kilometers of second track (including a fractional amount of third and fourth track). The railroads carry 90 per cent of the total freight. The Third Five Year Plan calls for construction of 11,000 kilometers of new first track and 8,000 of second track.

The strain on the Soviet railway equipment in shown by the following table:

Existing Rolling Stock on December 31, 1937	
Trunk line locomotives in operation	17,700
2-axle freight cars	524,900
4-axle freight cars	121,000
Freight carried, 1937	516,700,000 tons
Freight (thous. ton-kil.), 1938	369,100,000
Average daily car loadings, 1938 (calculated in 2-axle cars)	88,046

With 45 per cent more first track than in 1913, and the freight car capacity 2½ times greater, the actual goods carried in 1937 was almost four times more than in 1913, and the ton-kilometers almost 5½ times more. This increased traffic has been hauled by only 47.5 per cent more trunk line locomotives (the weakest spot in the system, as more than half of the locomotives are now old or obsolescent). Further evidence of strain is noted in the increase of the average daily run of a loaded freight car from 75 kilometers in 1913 to 139.8 kilometers in 1937, and of the average speed from 14.1 to 19.6 kilometers per hour. In speeding up freight movements, the Soviet Government has created the greatest intensity of freight traffic in the world, three times greater than that of the United States and Germany, and six times that of France.†

Russia's capacity to deliver oil, Manchurian soya beans and manganese to Germany must be estimated with these facts in mind. Let us examine the three categories in turn.

There are four possible routes to deliver oil from the Caucasus to Germany: via the canals of North Russia; via Rumania; via the Danube; and over the Soviet railroads. The canal route is long and roundabout, and is frozen for five to seven months of the year, therefore it is of limited use. Soviet oil has always been exported through the Mediterranean, which is now blocked. It might be feasible, with pressure on the Rumanian Government, to tranship a certain quantity of oil at Constanta for carriage over the Rumanian and Hungarian railways to Germany. Barges

*Compiled from production and consumption figures for 1938, published in *Frankfurter Zeitung*, August 29, 1939, and the *Times*, London, September 30, 1939.

†L. Volfson, A. Korneev, N. Shilnikov: *Razvitie Zheleznykh Dorog SSSR*, Moscow, 1939.

can go up the Danube, but in restricted numbers because of the congestion, the shallow mouth of the river, and the rapids of the Iron Gate. The Danube is usually frozen from December to February. Main reliance must inevitably be on the Soviet railways.

To deliver 8,000,000 tons of oil in one year from the Caucasus to Germany, a distance of 3,500 kilometers, the following schedule would be required : daily distance travelled, 139 kilometers ; time *en route*, 25 days ; daily arrival in Germany, 22,000 tons ; daily arrival in Germany in trains of 51 cars, 22 trains ; daily arrival in Germany of 20-ton tank cars, 1,000 cars.

For twenty-two trains to arrive every day, with another twenty-two spaced for every day in the twenty-five days *en route*, would require 550 trains, containing 27,500 tanks, constantly under load of oil. To allow for the returning empties this figure must be doubled, making a total requirement of 55,000 tank cars.

But there existed in the Soviet Union on December 31, 1937 only 19,088 4-axle tank cars. Between 1928 and 1937 Soviet factories built 14,236 4-axle tank cars. Of these 4,000 were constructed in 1937, indicating greatly increased output. The number of 2-axle tank cars cannot be determined from Soviet statistics, other than the fact that 6,500 have been built since 1932.

Leaving a wide margin for underestimation of the existing equipment, we would seen safe in assuming that the entire number of Soviet tank cars, if assigned exclusively to the German order, would fall 50 per cent short of the performance necessary to deliver 8,000,000 tons of oil in one year. Nor can it be expected that the Soviet planners would put so much capital and energy into the construction of so many tank cars that would be useful only during the period of Germany's war emergency. Moreover, the oil must be moved over the Soviet railroads of the densest traffic, in the Ukraine. These, and other difficulties, add up to form a belief that the whole oil transaction is too colossal for the existing Soviet equipment. What German engineers could make of the situation, however, given two years' time, must be kept in mind as a qualification of this conclusion.

A similar chart may be offered in regard to the transport of 2,351,000 tons of soya beans in one year from the Manchurian border to the new Russo-German frontier, a total distance of 7,000 kilometers : time *en route* (at 139 kilometers per day), 50 days ; daily arrival in Germany, 6,500 tons ; daily arrival in Germany in trains of 50 cars, 6½ trains ; daily arrival in Germany in large cars of 20-ton capacity, 325 cars.

On the basis of an average of 6½ trains arriving every day, and fifty days needed *en route*, there would be constantly under load of soya beans 325 trains containing 16,250 large freight cars. In this case all the cars would not return empty. These figures would be doubled if the soya beans had to be carried in the 2-axle freight cars which, because of the bulk of soya beans, can carry no more than 10 tons. The transaction, under these conditions, would involve 13 trains arriving every day, with 650 trains *en route*, containing 32,500 cars. This would be a colossal task for the already crowded Siberian railroads.

Now let us consider the transport of manganese. To deliver 720,000 tons of manganese ore from Nikopol (Ukraine) to German blast furnaces in one year, a total distance of 2,000 kilometers, the schedule would be as follows : time *en route*, 14 days ; daily arrival in Germany, 2,000 tons ; daily arrival in cars of 20 tons, 100 cars.

With two trains arriving every day, and fourteen days taken *en route*, there would be constantly under load of manganese ore 28 trains containing 1,440 cars. The shipment of the required manganese ore would thus be a more feasible transaction.

Whatever the amount of war supplies Russia can deliver to Germany, transhipment from the broad gauge to the standard gauge cars at the new Russo-German frontier presents a labor problem. This may be readily solved by the use of Polish prisoners and other forced labor. A further difficulty exists, at present, in the condition of the Polish railways after the German invasion. Many bridges were blown up, for example, or destroyed from the air. Also, the German railroads have been unable to meet their own traffic demands ; in 1938 only one-fifth of the orders for locomotives within Germany could be filled because of the diversion of locomotive plants to the armaments industry.

Considered separately, the delivery to Germany of oil, soya beans and manganese ore is in each case a job which would greatly tax the Soviet facilities ; and, except in the case of manganese ore, none of them could be executed except in part. Considered as a whole, the simultaneous transport of these three raw materials in quantities sufficient to meet German needs is an assignment which obviously the Soviet railways cannot execute.

IV.—How Can Germany Pay ?

By the Trade Agreement of August 19, 1939, Germany granted Russia a 200,000,000 marks credit for the purchase of German goods over two years. It is to be paid back nine-tenths in raw materials. Russia demands from Germany high grade machinery and the latest types of aviation and naval instruments. How these demands are to be met remains to be determined. If German industry were to work adequately for the repair of Russian plants, and to supply new equipment, Germany's ability to work for her own war needs would be cut. On the other hand, if the war in the West continues without the big offensives that consume *matériel* rapidly, German industry can accumulate stores of war equipment and may at the same time resume manufacture for export. At the present moment, it seems unlikely that Russia will realize on the specific credit offered. In November, 1939, Germany had no foreign assets whatever. The German gold reserve may be 500 million marks, but it is impossible to know how much gold was expended prior to the march into Poland. Expropriation of all the private gold in Germany, in the form of jewelry, sacred vessels, etc., could not yield more than an estimated 500 million marks.

Certain stunts, however, are possible. The Reich Government could decree the abolition of the use of tobacco, and order the usual German supply earmarked in Bulgaria sent to Russia instead, meanwhile filling Bulgaria's usual orders of sundry goods. Against the credit thus acquired for Germany's account, Russia could ship raw materials direct to Berlin. Such three-cornered arrangements are complicated and never could attain a sufficiently large scale. They are based on an inescapable further lowering of the standard of living in Germany, already very low. What caused the bitterness in 1917 was not only the famine conditions *per se*, but the fact that some Germans had plenty while others starved. The Nazis have the power to distribute sacrifice equally throughout the whole population. There is no way to measure the amount of suffering the German people can endure provided they all fare alike.

More extraordinary foreign assets may be realized by Germany through agreements with other states for the repatriation of German minorities into the Reich. Thus the German-Estonian Agreement of October 15, 1939,* contains clauses whereby securities, mortgages, etc., of the departing Germans are immediately placed under the control of the German Legation in Tallinn for transfer to the "German Trust Administration" to be formed at the German Consulate. This Trust will have charge of realizing on all the cash, real property, industrial and commercial enterprises, etc., of the former German residents of Estonia. It is estimated that they owned property valued at 50-100 million dollars ; while the belongings of Germans elsewhere in the Baltic would increase the figure to 500 million dollars. If all the Germans are repatriated on similar terms from Italy, Denmark, Hungary, Rumania and Jugoslavia, the amount of valuta realized by the German Government might well reach 4-5 billion dollars. Such a sum would more than cover Germany's adverse foreign balance in war materials and foodstuffs. The absence of any time limit in the Estonian Agreement, for the transfer of assets realized from the properties concerned, leaves the way open for Germany to demand immediate delivery of raw materials on account.

V.—Summary

From the above facts and estimates the following may be deduced :

(1) Russia cannot supply Germany with fats, iron ore, non-ferrous metals, rubber or cotton.

(2) Russia can meet Germany's deficiencies in manganese ore and timber ; and, with a year's interim for increasing the sown area, can meet any grain shortage likely to occur. How much barley Russia can produce and transport to Germany for fodder remains to be determined.

(3) Russia can produce sufficient oil for Germany's extraordinary needs in war, but on condition that Germany supplies the

*Text of financial and economic clauses of the German-Estonian Agreement of October 15, 1939, published in *The Financial News* (London), October 23, 1939.

equipment and technical assistance to reorganize Soviet industry and transport. Such reorganization would probably take two years.

(4) Russia cannot at present deliver sufficient oil to enable Germany to undertake a large-scale offensive without risk of exhausting Germany's oil reserves; and cannot transport soya beans from Manchuria in quantities sufficient to solve Germany's fat problem. Russia at present offers a partial solution, but not decisive aid, in regard to Germany's deficiencies in oil and fats.

(5) Since German industry is already overtaxed by war tasks, it is unlikely that the German Government can or will pay for raw materials exclusively in the currency that Russia demands, namely, high grade machinery and instruments. Further, transport costs over immense Russian distances will mount up to two or three times the price of the products themselves. However, in the search for means of payment in the past the Nazis have shown a genius for surprising stunts. Conceivably they might let the Bolsheviks acquire the German ships interned in Russian ports, including the *Bremen*. But the most promising method of payment would seem to be through the foreign exchange acquired by the sale of properties owned abroad by the German minorities now in process of repatriation to the Reich.

(6) It is suggested, therefore, that in a short war of big offensives Russia cannot give decisive aid to Germany. But if the present siege war lasts for two years, without major battles, so that there is a minimum expenditure of war materials in the field, and granted that Germany has time to accumulate war stocks and reorganize Soviet industry and transport, then Russian aid might well be decisive in determining the military outcome in the West. This presupposes, however, that Germany's internal structure could withstand a two-year siege, and that Russia would be willing to sacrifice domestic needs in order to aid Germany. Which is by no means certain.

VI—Russia's Willingness

For many years Soviet industrialization proceeded under the forced draft of having to pay for imported machinery by exporting raw materials and foodstuffs needed at home. Soviet "dumping" was a problem of the world market in the early '30's. But the need to force exports has been remedied by increasing the gold production. Russia has achieved what may be considered an independent position in foreign trade. The Soviet plan is to outstrip capitalist countries by the utmost development of domestic resources. Abnormal increases in exports, therefore, depend upon the willingness of the Soviet Government to sacrifice the needs of domestic plans for the sake of external political objectives.

Stalin has proclaimed a policy of trading with all countries. The Bolsheviks are realists. Therefore they probably will avoid becoming involved in the European war while at the same time taking every opportunity to strengthen Russia's defense toward the West, against the day of possible renewal of the *cordon sanitaire* of 1919, or even of the German *Drang nach Osten*. As a result of the re-division of Eastern Europe, her acquisition of a dominating position in the eastern Baltic, and the prospect of securing a foothold in the Balkans, Russia holds the balance of power in continental Europe. Stalin is not likely to yield that vantage in diplomatic manœuvre except to superior force. So long as Russia holds the balance, the Soviet Government will probably view the supply of Germany as a strictly business transaction.

But what if Russia's newly acquired position were upset by an Allied victory in the West? The ensuring changes in the political line-up might conceivably cause the Bolsheviks to extend their reach. Bolshevik doctrine predicts as inevitable the downfall of capitalism and imperialism (the British, French and Dutch Empires). If blockaded Germany should become desperate enough for the Nazis leaders to be willing to pay in any amount for Russian military aid, in order to ward off the imposition of a Carthaginian peace, and if at that moment it seemed possible for them to shift the German National Socialist revolution over to the Bolshevik rails, then Russia might agree to advance supplies and other assistance on long credit, even at the sacrifice of domestic needs. The two revolutionary régimes would then face the historical task of working out the problem posed by the logic of European geography: a marriage of the German surplus of skill and manpower with Russian space and natural wealth. A military alliance between the two revolutions is the nightmare of the West. On the other hand, an economic partnership, without military objectives, might provide a useful outlet for German energies and talents.

The answer to the general question of the decisiveness of Russia's aid to Germany must therefore be conditional. The longer the war lasts, the more effective that aid should become. But Russia is not likely to make real sacrifices for Germany unless the internal situation there becomes ripe for deepening the brown complexion of National Socialism to the color which Bolsheviks prefer.

For War or Peace?

By WALTER LIPPMANN

(New York Herald-Tribune)

LESS than twenty years ago the British and French were the masters of Europe, and along with the United States the three great Atlantic powers exercised an almost undisputed supremacy throughout the world. To-day we are all of us driven from the Orient and in Europe Britain and France are uncertain whether they can still defend the vital links of their empires.

It is not very enlightening to ascribe this revolutionary change in the balance of power to the rise of the dictators. For the German and Italian dictatorships were conceived and created in the very period when the democracies were all-powerful in arms, in prestige, in commerce and in finance. The plain fact is that when the western democracies had supreme power they failed to conciliate the peoples of central Europe; and now that they no longer have supreme power, now that there have been raised against them formidable challengers, the democracies do not know whether they can face the risk of defending themselves.

From the armistice to the accession of Hitler, the western nations, including our own, abused their power by failing to be just and to be liberal. Since the accession of Hitler they have been unable to make concessions, and yet they have been afraid to resist the demands made upon them. Lacking magnanimity when they exercised supremacy, they now lack resolution when they are challenged.

What the democracies would like is to remain undisturbed in the enjoyment of all their possessions. They would like to keep what they have, not only their colonies and their dependencies, but also their monopolies and their preferences, and they would like never to have to defend what they have. Thus they can barely persuade themselves to make the relatively small concessions embodied in Secretary Hull's policies, and for the rest they would like to keep the world in order by reminding it that it would be as noble as it would be convenient for them if all treaties were habitually respected. They would like to placate the challengers by uttering fine sentiments and to overawe them by rhetorical threats.

But, whether we like it or not, the challenging powers are as realistic as they are ruthless. There is no way to satisfy them by promises and there is no way to combat them by making speeches. The challengers are prepared to fight for what they want; they

are completely persuaded that they are entitled to have whatever they can take. So they are not to be put off by homilies, no matter who pronounces them, and they are much too shrewd and much too bold to be bluffed.

When, for example, they hear the President of the United States talk about a quarantine against treatybreakers, they are impressed only in so far as they think, and to back it, if called upon, with the whole military power of the United States. They do not care about his language, however pleasing it may be to newspaper readers in London, Paris, Valencia, Moscow and Nanking.

What they consider is whether he would really act, and when they find him hastening to promise the American voters that he will do nothing which involves the risk of war, the word "quarantine" has no present value and is merely stagemoney.

Since we cannot deceive the challengers, let us not deceive ourselves. We are living in a world in which great militarized nations are bent on conquest. The democracies are potentially stronger than the dictatorships, but they are softer, more self-indulgent, and more confused. They are unwilling to face the fact that in dealing with governments that are willing to fight, there is no form of influence which really counts unless it is backed by a willingness to fight.

Thus it is not only useless but dangerous to talk about sanctions and quarantines and other provocative measures unless that talk is founded on a willingness to face the final risk of war. There is no such thing as a half-way and half-hearted policy in the ultimate issues: there is no such thing as proposing to choke the Japanese, but not to strangle them. There is no way of threatening the Japanese if the threats are not meant seriously. There is no such thing as fighting the Japanese without fighting them.

Provocative talk without sincerity of purpose can end only in humiliation, in the exasperation of the challengers, and in providing them diplomatic triumphs which will increase their strategic power.

Emerson used to say that when you strike at a king you must kill him: Germany, Italy and Japan will respect the western powers only in the degree to which they are convinced that there are definite points at which the western powers really mean to stand absolutely and to fight totally.

If the militarized nations believe there is no such definite point, they cannot be threatened, bluffed or placated.

The heart of the problem of war and peace is whether the democracies really mean to resist or to surrender, and the policies of the dictatorships will be guided by what they believe is the real intention of the democracies.

If the democracies really did mean to resist, and meant it so sincerely that no one could doubt it, they are still strong enough to restore order in the world, and then to achieve peace by making substantial concessions.

But if the democracies do not mean to resist then step by step, position by position, they will be pushed and manœuvered out of their place in the world and forced ever more deeply into a frightened and precarious isolation.

How the Enemy of the Chinese is Overcome by Quinine

THE Chinese people, who, long before the time when Western civilization made its appearance in Europe, had known periods of great prosperity in the scientific and artistic domains, were not spared by any of the scourges of humanity. Famine, cholera, malaria, typhus, floods, revolutions and wars, have at different times, led this people to the verge of the tomb.

News that reaches us from the province of Fukien (South China) states that an epidemic of a malignant form of malaria has broken out, attacking thousands of people, of whom many have already succumbed. From the districts where the Japanese are operating come alarming reports about malaria epidemics, which are being fought by the distribution of quinine carried out on a large scale.

Ten years ago, the first trial was made with anti-malarial measures in Hunan, a province in the north of China. But the civil war drove the peasants from their farms, and consequently the malaria mosquito has in a short time conquered the abandoned territories and attempts made to establish refugees there have failed.

Dr. R. C. Robertson, the British delegate sent to China by the Anti-epidemic Ambulance of the League of Nations, pointed out recently that high officials, as well as the humblest coolies, are full of gratitude for the salutary work of this Ambulance, but still more for the recommendation authorized, drawn up by the Malaria Commission that it has instituted and which prescribes the daily taking during the fever season, to prevent malaria, 6 grains of quinine, and for a cure itself, a dose of 15 grains to 20 grains of quinine per day during five to seven days. On page 124 of its report, issued in 1938, this Malaria Commission stresses the fact that the harmlessness of quinine makes it a suitable drug for administration by subordinate personnel without constant medical supervision, whereas such supervision is essential in the case of synthetic products.

The fight of the Chinese people against the malaria mosquito has been going on for centuries. But thanks to the help of modern medical science, China will also succeed one day in throwing off this enemy that is so dangerous for the health of its people.

New Consul-General at Shanghai

MR. FRANK P. LOCKHART, Counsellor of the American Embassy in Peiping, has been appointed new American Consul-General in Shanghai. Mr. Lockhart succeeds Mr. Clarence E. Gauss, who left Shanghai to become first American Minister to Australia. Mr. Lockhart served as acting Consul-General in Shanghai two years ago when Mr. Gauss was on home leave in the United States.

The date on which Mr. Lockhart will take up his new duties in Shanghai has not yet been set, but Mr. Richard P. Butrick, executive consul, is expected to remain as acting Consul-General until Mr. Lockhart's arrival in Shanghai.

In point of time Mr. Lockhart has not the longest record in the Far Eastern department of the American consular service, but he has in the past been entrusted with the most delicate of missions to China, including a special mission to the Far East in 1919 and membership on the secretariat of the American delegation at the special conference on Chinese customs tariffs in 1925.

Born in Pittsburg, Texas, in 1881, Mr. Lockhart went to Grayson College near his hometown and in 1900 set out in the newspaper publishing field with *Pittsburgh Gazette*, of which he was associate editor until 1902, and in which he still owns an interest.

Politics attracted his interest then, and until 1913 he was secretary to his Congressman. During the latter year he was secretary to a senator, filling a Department of Agriculture post at the same time.

Finally on July 29, 1914, a diplomatic career opened when Mr. Lockhart was appointed assistant chief, Division of Far Eastern Affairs at the State Department.

He held this post with a short time out in 1919 as drafting officer in the army, until the latter part of the year when he was sent on a special mission to China which lasted until 1920. The following year found him appointed to the Washington Arms Limitation Conference as expert assistant. Thereafter until 1925 Mr. Lockhart occupied the top post in the Division of Far Eastern Affairs.

In 1925 he attended the Peiping tariff conference and a short time later began consular duty in China as Consul-General at Hankow on April 5, 1925, and stayed until he was transferred to the Tientsin post in 1931.

In 1935 Mr. Lockhart was again shifted, this time to Peiping, where he was made Counsellor of Legation until it was created an embassy in September of the same year.

Since then he has been Counsellor of Embassy, undertaking much of the routine duty which the Ambassador, Mr. Nelson Johnson's absences at Chungking make necessary.

Hsinking, Capital of Manchoukuo

HSINKING, the modern capital of Manchoukuo, lies at the northern terminus of the main line of the South Manchuria Railway at a distance of about 702 km north of Dairen, and 240 km south of Harbin.

That the capital may serve as a symbol of rising Manchoukuo, a thoroughgoing planning, the so-called special city plan, was adopted in the construction of Hsinking. The planning entailed the change of the administrative system from the tri-system of the former special city office to the Hsinking special city office, with a similar change of the capital construction bureau and the South Manchuria Railway Zone to the same central authority, following the transfer of the administrative right of the South Manchuria Railway by the Japanese government to Manchoukuo.

The city is not only the significant junction point of the international traffic by virtue of being the converging point of the Dairen-Hsinking Line, Hsinking-Tumen Line, Hsinking-Harbin Line and Hsinking-Paichengtzu Line, but it also forms an important connecting link in Asiatic-European traffic. Having the natural advantage of being located in the center of rich fertile land together with its proximity to virgin forests in the hinterland, the city is also an indispensable accumulating and distributing point of staple products. Hence, it is called the "City of Beans." Thus an erstwhile Manchu town known as "Changchun" where nothing but kaoliang fields greeted the visitors' eyes some seven years ago is, to-day, the pride of Asia as the metropolis of rising Manchoukuo. The capital, moreover, is not only the political, economical and cultural center, but also a communications center.

A census taken recently by the Municipal Office discloses a tremendous increase of population, a fact which alone attests the never-ceasing progress of the capital. The population at the end of March, 1939, is given as below :—

Nationality	*Men*	*Women*	*Total*
Japanese	52,711	41,819	94,666
Manchoukuoans	174,226	111,148	285,374
Sub Total	226,973	53,067	380,040
Others	—	—	1,095
Grand Total	—	—	381,135

Though within a short space of time Hsinking, formerly known as "Changchun," as has already been noted, has achieved a remarkable development with a rapidity that has astonished the world, the history of its origin dates back some one hundred years or so. Until then, this area and its vicinity was a vast pasturage belonging to the Banner of Mongolian Koruras. Later, under the Han dynasty of China, Chinese immigrants established a town called "Changchunpo" at a point ten miles north of the present city. In 1825, under the Ching dynasty, this town was selected as the seat of local government because of its beauteous surroundings, genial climate, and abundant water supply. From this date until the advent of the new state of Manchoukuo in 1932, the region was called "Changchun."

By virtue of the Sino-Russian Treaty of 1899, Czarist Russia extended the Chinese Eastern Railway southward to Port Arthur and established its terminus at Kanchengtzu. Following these memorable events the town began to develop suddenly, grasping firmly a greater degree of importance as the local center, which incidentally led to a sudden increase of population.

Subsequently, in 1905, under the Russo-Japanese peace treaty Japan took over the railway line south of Changchun and established the South Manchuria Railway Company. In 1910, she bought up the uncultivated area between the Walled Town and Kuanchengtzu, a section which has since been called the S.M.R. Zone. The geographical advantage of the place and the immigration which it encouraged has spelled a growing prosperity for the city.

Hsinking as the Tourist City

Western visitors to the Metropolis will be surprised at the size and remarkable modernization that has been effected in its city planning, with its magnificent buildings and residential quarters, and the well mapped-out plan for further improvements. Although the capital city and its environs lack the entertainment that an ordinary traveller expects to find in a big city, the striking contrast between the old and the new and an exceptionally large number of parks are the sources of never-ceasing charm with which the city is abundantly blessed. The newer section of the city discloses a beautiful picture of a gorgeous modern capital with rows of ultra modern "edifices" adorning the tree-lined thoroughfares, from the surface of which the ugliness of telephone wires and sewers is completely hidden, while in the older part of the city, colorful Oriental charm abounds, with curious shaped shop signs hanging from the eaves of dark, gloomy looking "Mud Hut" and clustered red, yellow and green lanterns festooning the narrow streets.

The New State Council Building at Hsinking

Three main thoroughfares, namely: Chuo-dori, Nihonbashi-dori, and Shikishima-dori, each being provided with a promenade side walk, and a special path for carts and a road for motor-cars, extend from the plaza in front of the station.

Chuo-dori (Central thoroughfare) runs right through the central part of the metropolis ultimately joining the Tatung boulevard at the bordering point of the new and the old town. Important buildings such as the S.M.R. Hsinking Office, the Yamato Hotel, the Custom House, the Manchuria Information Bureau, the Police Station, the Hsinking Shrine, the Library, and Kodama Park are all located along this thoroughfare.

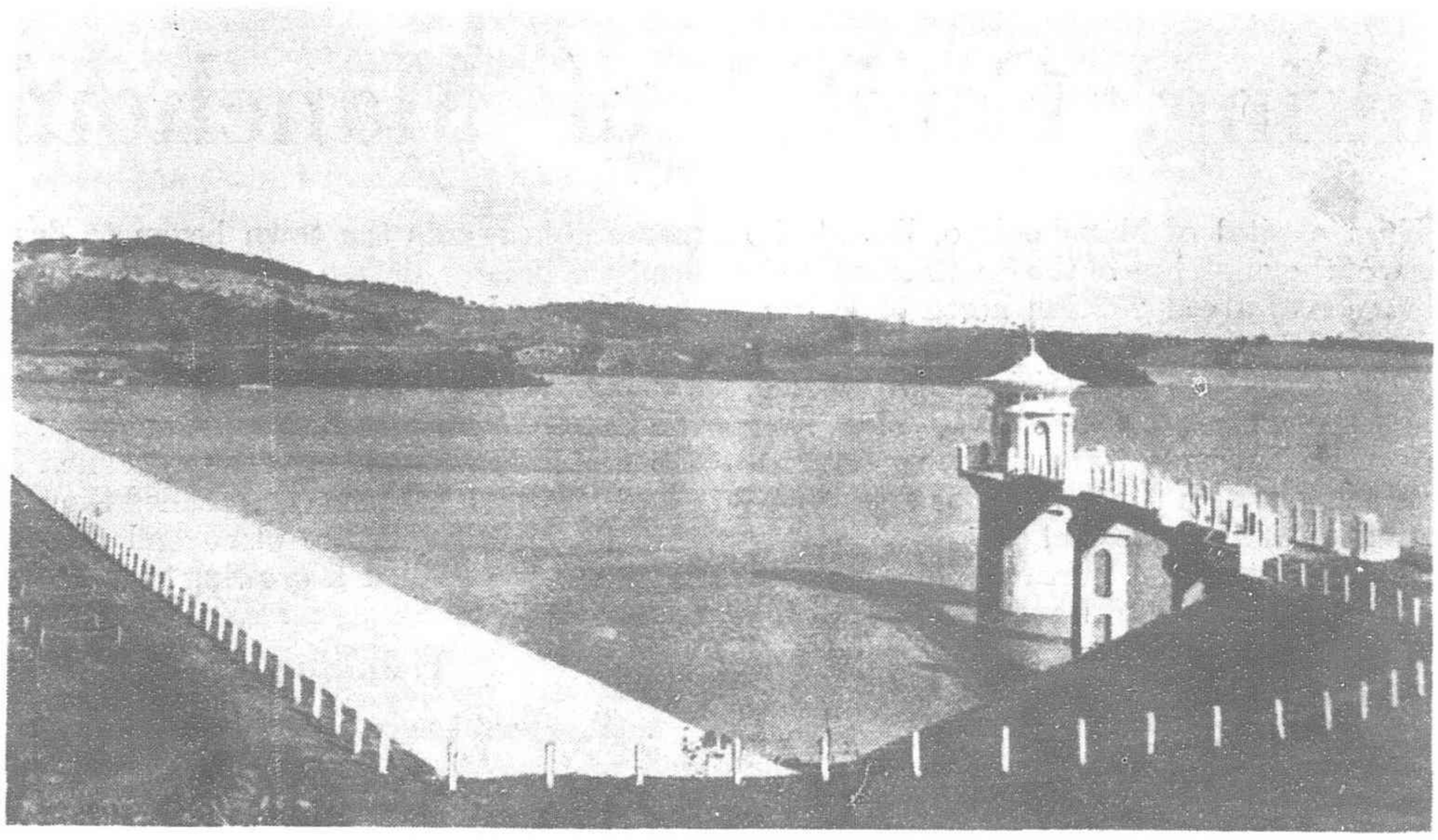
Nihonbashi-dori stretches away toward the South Circle cutting diagonally across Fuji-cho, Mikasa-cho, and Yoshino-cho. At the foot of the bridge which marks the end of Nihonbashi-dori, there is a lovely park known as the "East Park." The entrance of this park is marked by a pair of grotesque, upright figures of stone carving.

Tatung (Raido) Boulevard and Circle

The Chuo-dori stretches away straightforwardly from the plaza in front of the station as far as the Kodama Park, thence combines Daido (Tatung) boulevard, the main traffic artery of the capital which, in turn, ascends far out to Nanrei (Nanling) beyond the Daido Circle. Until the new State came into being, the Daido boulevard was nothing but a mere expanse of uncultivated plain,

to-day it is elm-bordered, and can well boast of being the most representative modern thoroughfare in the city.

Important organizations of nearly every scope of national as well as civil affairs seem to cluster around this thoroughfare; i.e., the Kwantung Army Headquarters, the Headquarters of Gendarmerie, the Nikke Building, the Taiko Building, the Koutoku Kaikan (Kang Toh Hall) and the Minakai Department stores stand in a row. At the Daido Circle itself stand the Hsinking Special City Hall, the Police Headquarters, the Manchuria Telephone and Telegram Company, the Central Bank of Manchoukuo, and the Industrial Bank of Manchoukuo.



The newly completed Chingyuehtan Reservoir at Hsinking

Hsinking Shrine

Within walking distance from the Hsinking station on the west side of Chuo-dori there stands a huge stone " Torii " that marks the entrance to Shinkyo Jinsha. It enshrines the Sun Goddess, Amaterasu Okuninushino-mikoto and the spirit of Emperor Meiji, and is highly respected by the citizens as the guardian deity of Hsinking.

A magnificent castle-like structure bearing the Imperial crest of the chrysanthemum, situated south of Kodama Park, is the Headquarters of the Kwantung Army and the seat of the Japanese Legation.

The beautiful Memorial Monument, tall and gleaming white, atop the hill near the Peian road, is a memorial wherein are enshrined the spirits of late General Muto who laid the foundation of the new state, the 2,900 souls of heroes that fell on the fields of recent Manchurian battles. The monument is a masterpiece of oriental architecture, befitting the solemnity of this sanctuary.

Kuanchengtzu is situated at the former terminus of the southern section of the Chinese Eastern Railway about 2.7 km from Hsinking Station, and can be reached in 15 minutes by carriage. Despite the fact that through the advent of the capital, the locality has been deprived of the prosperity of former days when it was the thriving business center of the Russians who constituted the majority of the populace, the place is historically famous as the site of the severest battle fought in recent Kuanchengtzu incidents. Where crowds pass daily, for most part heedless of the past, numerous tablets here and there proclaim the many battles fought.

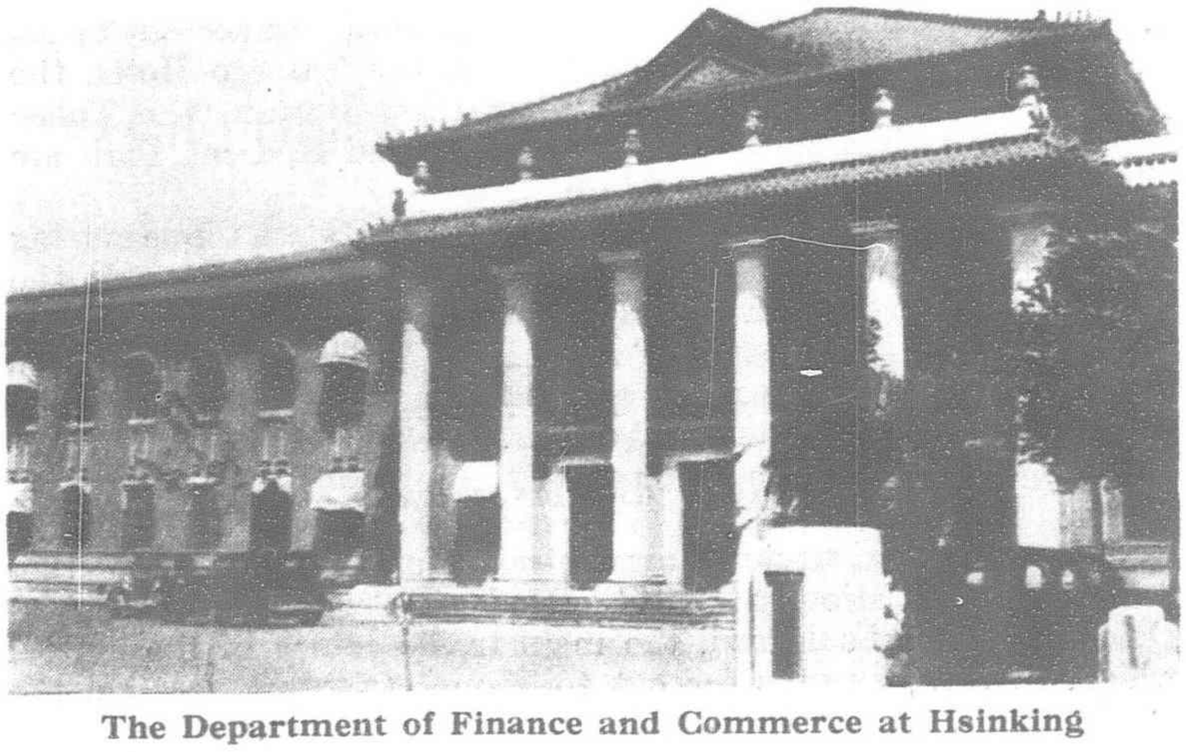
Except for the Imperial crest of the orchid that shines brilliantly on the imposing entrance to this temporary residence for the royal family, the present site of the palace in an unobstrusive part of the capital can hardly be designated as such. However, the site chosen for a permanent palace near the Junten Circle is the memorable area wherein the coronation of the emperor took place and is invariably referred to as the " Temple of Heaven " by the citizens. Here the permanent palace will in time be completed.

The Central Bank of Manchu at Hsinking

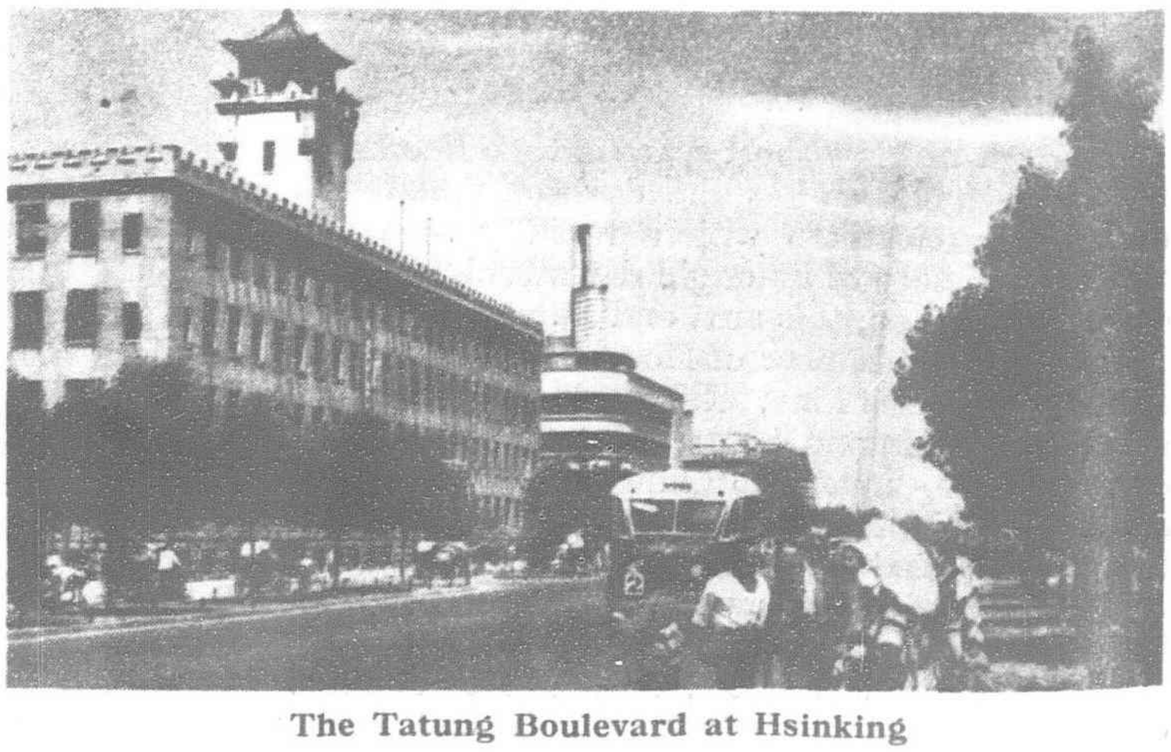
Representing the refreshing beauty, symbolic of the rising metropolis in this modern setting, stands impressively the magnificent State Council building. It is near the Junten Circle, and is surrounded by stately structures, such as the Department of Foreign Affairs, the Department of Communications and the Synthetic Law Court Building. Incidentally, with the projected building of the palace nearing completion in this vicinity, the present site of South Hsinking station will inevitably become the central station in the near future.

Kodama Park

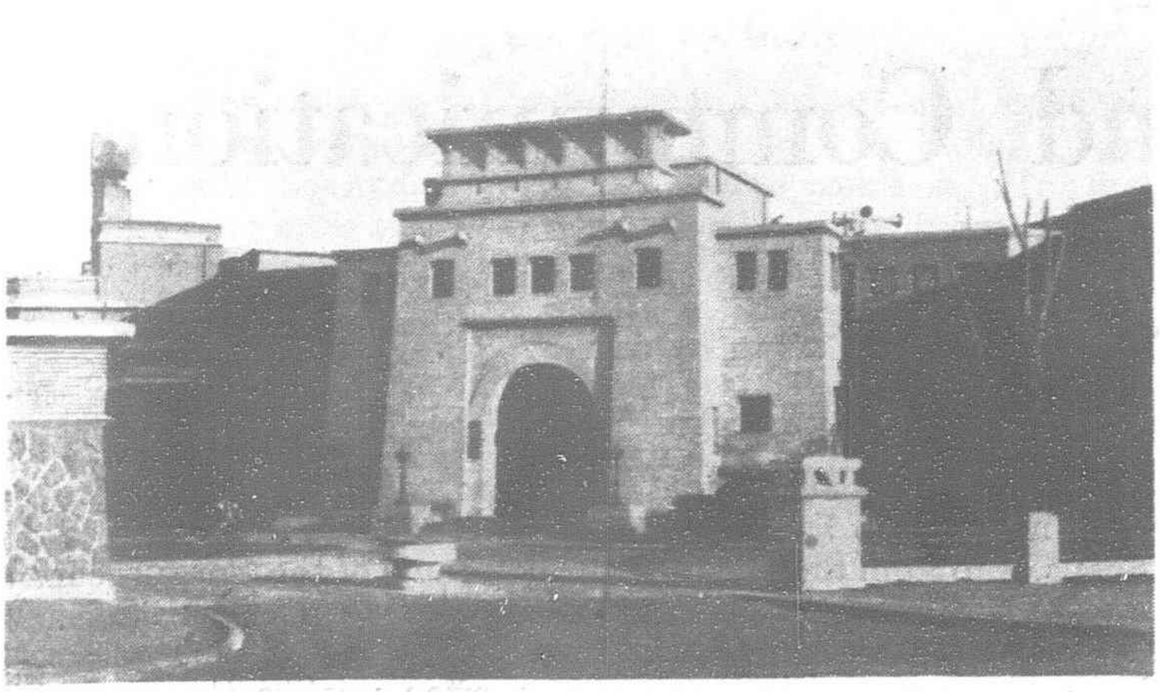
In commemoration of the triumphant entry of the late General Kodama into Hsinking following a victory in a Manchurian incident,



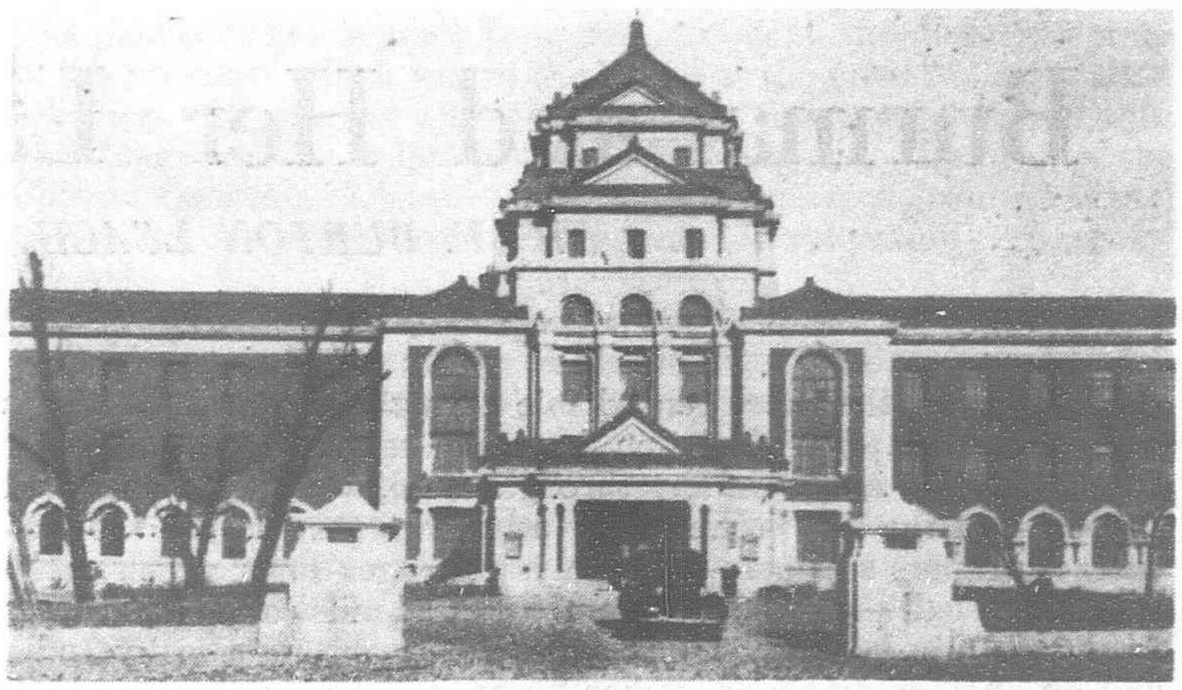
The Department of Finance and Commerce at Hsinking



The Tatung Boulevard at Hsinking



The Bureau of Foreign Affairs at Hsinking



The Department of Justice at Hsinking

a bronze statue of the general was erected at the entrance of the park. Thereby the former West Park was renamed Kodama Park. It lies at the end of Chuo-dori, occupying an immense area of 349,149 sq. meters, and is the largest, and loveliest of all the parks in the metropolis.

Beautiful gardens within the park, filled with seasonal flowers, and verdurous woods together with lovely lanes that encircle the pond afford citizens the charms of walking in carefree ways. Besides being the popular playground for holiday makers, the park, being adequately provided with athletic and recreational facilities, such as a zoo, a children's playground, a pool, and a baseball ground, has become the indisputable center of sports activities throughout the year. In spring and summer, the pond is a picturesque scene of happy-go-lucky twosomes, and foursomes, paddling a pleasure boat under the tunnel of plum blossoms in full bloom, and in winter, it is a lively center of skating. The cenotaph which stands high on a hill, is dedicated to the souls of heroes who have sacrificed their lives in the recent Kuanchengtzu incident.

A sheep carved in stone standing in front of the Concordia Association Headquarters marks an entrance to the Hakusan Park, which is famed for its unsurpassed beauty.

Daido Park occupies an area adjoining the Concordia Association and is the first of the many parks planned by the Capital Construction Bureau that was completed. A huge outdoor music hall erected on the hill facing the lovely lake furnishes music during the seasons.

A colorful wayside shrine that stands like an old tomb on the Daido thoroughfare is an engaging but curious sight unbecoming the modernity of its surrounding. Following the establishment of the capital, this small sanctuary was destined to be removed elsewhere but remained untouched because it symbolizes the filial piety of the devoted son for which the shrine is dedicated, and the firm belief which Manchoukuoans, both young and old, maintain in its virtues.

Here one sees a simple and queer form of religious ritual performed by a priest, donned in ragged cloth, who stands beside the altar before which devotees kneel as they come.

Of the many scenic charms available in and around the capital, the lovely lake " Nanko," which occupies the larger part of Ouryu Park is the prettiest of all. During the spring and summer, pleasure boats float on the lake to provide recreational facilities for holiday makers, and in winter the lake becomes the mecca for hundreds of skating enthusiasts from far and near.

The white plastered gorgeous structure, seen at this point of the Daido thoroughfare, is the Continental Institute of Science. This undertaking was inaugurated on March 19, 1935, under the direct jurisdiction of the Prime Minister with the supreme object of developing the rich natural resources.

Kenkokubyo, the magnificent cathedral-like structure which is nearing completion at the Kenkoku Hiroba, south of the Tairiku Institute of Science, is the principal repository of the metropolis. Here are enshrined the spirits of patriotic pioneers who laid the foundation of the new state of Manchoukuo. The solemn beauty and charm of oriental architecture are uniquely embodied in the construction of this sanctuary, and when it is completed, it will serve a precinct of 40 million square miles. As one enters the towering main gate, he is impressed with the massive halls each designed and built differently to represent the specific functions of the sanctuary.

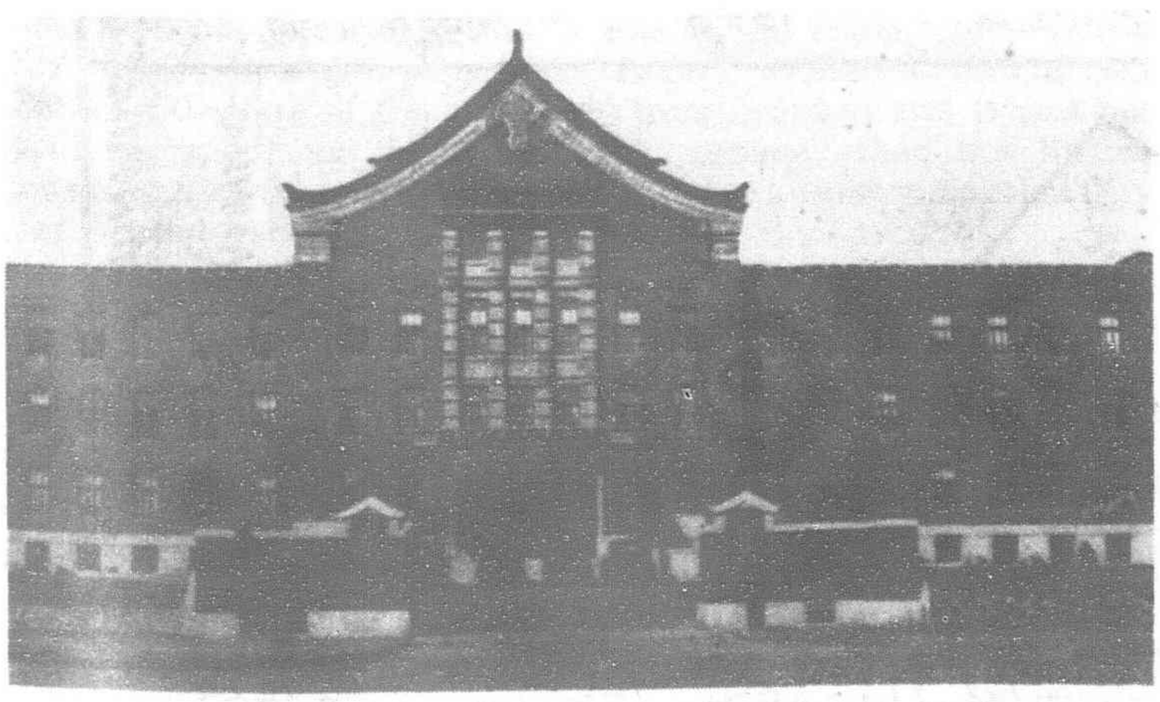
Jogetsutan is a lovely " water village " formed around a gigantic reservoir which was completed after two full years' work at the huge cost of 350 million yen. Less than 12 km from the heart of the metropolis, this village is situated within easy hiking or motoring distance, and possesses a rare attraction for holiday makers seeking a day's vacation. Walks around the shaded lake and delightful bush retreats for picnic outings, and beautiful bowers on the picturesque hill are some of the outstanding qualities of this region as a popular holiday resort.

On Sundays and holidays from May till October, a special sightseeing bus is operated between the capital and the Jogetsutan source of water supply. The bus leaves the plaza in front of the station at 9 a.m. and returns at 2 p.m. The fare is Y1.30 per adult for a round trip.

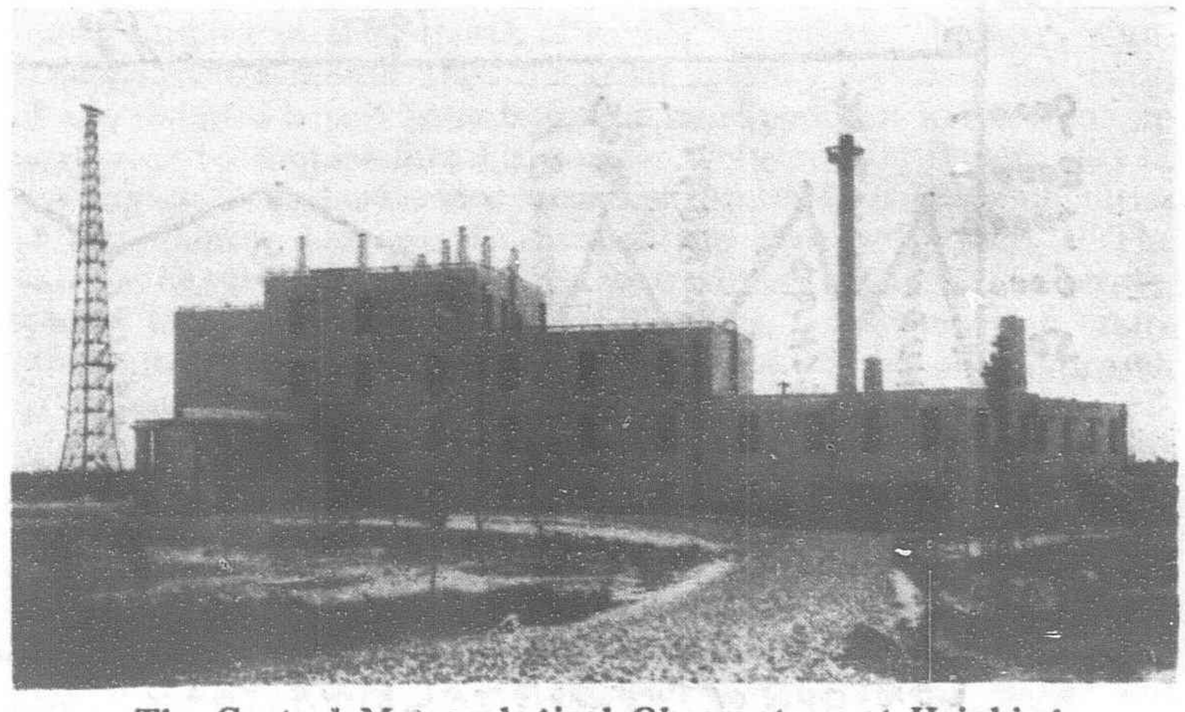
Manchoukuo Government

Since the establishment of Manchoukuo on March 1, 1932, various government organs have been set up and the new government is executing its function in an admirable manner.

(Continued on page 151)



The Department of Communications at Hsinking



The Central Meteorological Observatory at Hsinking

Burma and Her Land Communications

By F. BURTON LEACH, C.I.E. in The Asiatic Review

(Proceedings of the East India Association)

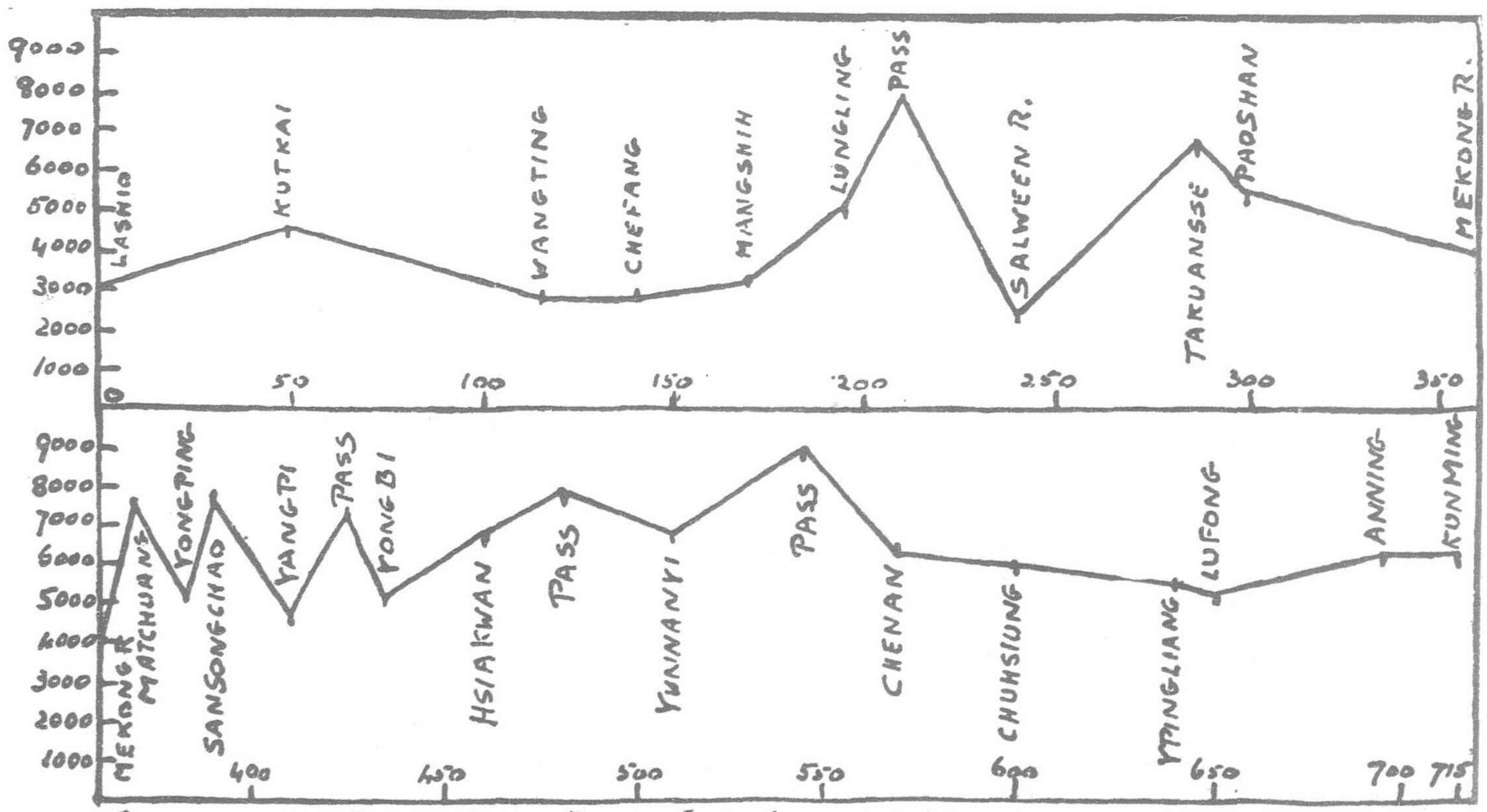
ONE of the most remarkable things about Burma is its geographical isolation from the rest of the world. By sea it is not on any through route, as Rangoon lies well off the line between any other two ports; even the Calcutta-Singapore steamers—the only passenger lines which make it a port of call—have to go several hundred miles out of their way to do so. By land, though it is bordered on one side by India and on another by China, it has no railway communication with either, and only in the last year has a motorable road been made into China. There is still no road into India passable by any kind of wheeled vehicle. Communications with the other two countries on its frontiers, French Indo-China and Siam, are equally primitive. The former only touches it for about 100 miles along the Mekong river on the extreme east of the Shan States, and the country on both sides is so wild and thinly populated that communications have never been seriously considered. With Siam, however, it has a land frontier of about 1,000 miles, and there has been contact, sometimes for trade, sometimes for war, for centuries. It is now possible to go from Rangoon to Bangkok by motor by a circuitous route through the Shan States to Chiengmai and thence by rail to Bangkok, a distance of some 1,200 miles, but for purposes of through transport this route need hardly be considered. Only since air-transport started has Burma come on to any world route of importance, Rangoon being on the line from England to Australia.

It is not my purpose, however, to discuss sea or air-routes, but only the existing and possible communications by land between Burma and the neighboring countries, which have become a matter of much greater interest owing to the Sino-Japanese war and the construction of the motor road from the Yangtze to the Burma frontier, which has given reality to some extent to the project which has been discussed for the last seventy-five years of making Rangoon a port of China. This is the most interesting and important of the land routes between Burma and the rest of the world, but before coming to it, I would like to speak briefly about communications with other countries.

The Siamese Border

It is convenient to start with Siam. The Siamese or Thai, as they now ask to be officially called, are of the same race as the Shans, who form the bulk of the inhabitants of the plateau country on the east of Burma and of three or four of the northernmost districts of Burma proper, and it is only natural that there should have been constant relations, more often warlike than peaceful, between the two countries. The natural approach to Siam from India and the west would seem to be from one of the ports in Tenasserim, the southern coastal strip of Burma, and the most southerly district, Mergui, was for some centuries part of Siam, and its old port of Tenasserim, no longer accessible by sea-going ships, was the principal port of Siam for all travellers from the west. Recent investigations have shown that it was probably by a route further south that Indians first reached the great Khmer Empire of South-Eastern Asia, whose ruins show clear traces of Hindu influence, but in the seventeenth and eighteenth centuries Mergui was the usual approach from India to Siam.

The road, however, has long become nothing but a mere jungle track, hardly feasible even for pack-animals, and there has never been any serious proposal to open out communications there either by road or rail. If Burma and Siam are ever linked, this is the easiest route, as the densely wooded mountains which divide the two countries increase in height and in breadth from south to north. On the other hand, Mergui is a long way south of the line from Rangoon to Bangkok, and such proposals for a railway as have been considered were to start east from Moulmein or Tavoy. The country, however, is extremely difficult, and it is most improbable that any trade would spring up which would make a railway or a motor road a commercial success. The few passengers who want to go from Rangoon to Bangkok can now do so by air in two hours, and it looks as if air transport had finally killed any idea of a Burma-Siam railway. Even a road is hardly more than a dream of the remote future.



CONTOUR OF THE BURMA CHINA ROAD. Scale, horizontal, 1 in = 50 m., vertical, 1 in = 5000 ft.

The Approaches to India

Let us turn now from the south-east to the north-west of Burma and consider the question of communication with India. There are two possibilities and two feasible routes in each case. The first possibility is to cross the mountains which separate Burma proper from Arakan, the coastal strip running from the borders of Bengal down to Cape Negrais, and thence on to Chittagong, where there is a railway to Calcutta ; the second is to start from some point in the north of Burma and link up with the Assam railway. The second gives the shortest length of new road or rail to be constructed, but the country is very difficult and very sparsely populated ; the journey from Calcutta to Rangoon would be very long and expensive, and there is little prospect of diverting either passengers or goods from the sea-route, which would be both quicker and cheaper. To go through Arakan would involve more new construction, but it would link Arakan with the rest of Burma, and there would be a certain amount of local traffic to be picked up there. A serious drawback is that the main line could not well pass through Akyab, the only important port, which would have to be approached by a branch line.

There are two possible passes over the mountains from Burma to Arakan, the Taungup pass in the extreme south, leading from Padaung opposite Prome on the Irrawaddy to Taungup on the Arakan coast, and thence up the whole length of Arakan to Chittagong, and the An pass leading from Minbu on the Irrawaddy to the neighborhood of Kyaukpyu. Both these routes have been surveyed for a railway ; the Taungup pass, being only about 2,000 feet high, is the easiest way across the Arakan mountains, the An pass being about 4,000 feet, but Arakan is an extremely difficult country for either rail or road construction, as it consists largely of mangrove swamps intersected by numerous tidal creeks, and the railway or road would have to be heavily embanked for most of its course, and the bridging would be extremely expensive.

Further north there are two possible routes to link Burma with Assam without touching Arakan. The first is to start from the Chindwin river and go through Manipur, and the second is to start from Mogaung on the Burma railway and go through the Hukong valley. Both routes involve crossing a long stretch of mountainous country, much of it practically uninhabitable, particularly on the Hukong valley route, where there is no chance of any local traffic. It can safely be said that no railway from Burma to India is likely to be a commercial success, and it could only be justified on strategical grounds, in the event of the sea-route being interrupted. This happened for three weeks in September, 1914, when the *Emden* was in the Bay of Bengal, and this event naturally led to much discussion of the question, but nothing has ever come of it. Since then, the development of air transport has made the construction of either a road or a railway between India and Burma less likely than ever.

The Access to China

This is as much as I propose to say about communication between Burma and the other countries across its frontiers, and I will now turn to the most interesting question at the moment, the new Burma-China road, and the projected railway.

There has for centuries been a road across China to Yunnan, and thence down to the Irrawaddy river at Bhamo. The first description we have of it is in the pages of Marco Polo, and it is clear from his description that it was an old trade route even in those days. It seems certain that Marco Polo himself did not visit Burma and wrote of the road only from hearsay, and it was not until the middle of the seventeenth century, when the British appear to have had a factory at Bhamo for a short time, that any European visited the north of Burma.

All communication with the interior of Burma then ceased, and it was only after the annexation of Arakan and Tenasserim that Major Burney, the resident at Ava, obtained permission to send an officer to visit Bhamo in 1835. The officer was Captain Hannay, who obtained from the Chinese traders the first reliable information about the routes into Yunnan. He did not, however, go up from Bhamo into China, and the withdrawal of the British resident at Ava a year later closed the country again for another thirty years, and it was not until 1868, after the second Burmese war, that Captain Sladen made the first journey into Yunnan from Burma. His objective was Talifu, which had been reached from the east by the great French explorer, Francis Garnier ; but Captain Sladen was unable to get beyond Tengyueh, owing to the disturbed state of the province, which was in the throes of the great Muhammadan rebellion. It was not till 1874 that the country between Talifu and Tengyueh was at last penetrated by Augustus Margary, of the Chinese Consular Service, who travelled unarmed from Shanghai to Bhamo, one of the most brilliant feats of exploration ever accomplished.

Ten years later Upper Burma was annexed, and the country was soon opened up and the old trade between Burma and China was revived. It is remarkable, however, that even before the route had ever been traversed by a European the idea of Rangoon becoming a port of south-west China had taken firm root. As early as 1861 a paper was published in the *Proceedings of the Royal Geographical Society* on the communication of the south-west provinces of China with Rangoon, and in 1864 Dr. Williams wrote on the question of trade with China through Burma in the *Journal of the Asiatic Society of Bengal*, while in 1865 another Mr. Williams actually wrote a memorandum on railway communication. Even more remarkable was a memorial on the subject from the Wakefield Chamber of Commerce to the Lords of Her Majesty's Treasury in 1869, and two years earlier the Rangoon Chamber of Commerce had written to a "mercantile man," Mr. Theodore Stewart, who accompanied Captain Sladen's mission, expressing the hope "that a prosperous trade will ere long be established between China and British Burmah, and that the time is not far distant when the prediction that Rangoon will become the Liverpool of the East will no longer be a dream of the future but an accomplished fact."

The Railway Project

It must be remembered that at this time the possibilities of the development of Burma itself were underrated ; it was not until the opening of the Suez Canal and the consequent expansion of rice-cultivation in Lower Burma that Rangoon became a great port ; also the geographical difficulties of crossing Yunnan were not realized until Margary's journey from Talifu to Bhamo. The earlier talks of a railway were sometimes based on the idea of a line running north from Moulmein through the Shan States rather than from Upper Burma. This it is true would avoid the Salween crossing, but it still leaves the Mekong crossing to be accomplished, and this length of line would be prohibitively expensive. As soon as the railway was carried through to Mandalay after the annexation of Upper Burma in 1886, and afterwards, when it was extended to Lashio in the Northern Shan States, it was realized that the only feasible route was from Bhamo or from Lashio.

The Lashio branch was intended to continue to the Salween at the Kunlong ferry, with the idea of eventual extension into China ; but this project was vetoed by Lord Curzon when he visited Burma as Viceroy of India in 1901. He was remarkably outspoken, even for Curzon, on the scheme. "The idea," he wrote, "that the wealth of Szechuen would stream down a single metre-gauge line, many miles of which would have to scale mountains by a rack, to Rangoon, while the great arterial rivers flow through the heart of the province of Szechuen itself—which are quite competent to convey its trade to and from the sea—is one, as it seems to me in the present stage of Central Asian evolution, almost of midsummer madness."

Whether or not Lord Curzon had seen reports of Major Davies' journeys in Yunnan in 1899 and 1900 I do not know, but his opinion found support in the reports of earlier travellers. Margary's untimely death a month after his great journey deprived the world of any detailed report from him, but an expedition which went up next year to enquire into his murder included Mr. Baber, also of the Chinese Consular Service, who first recorded the vast difficulties of the country between Talifu and the Burma frontier. "The valleys, or rather abysses, of the Salween and Mekong," he wrote, "must long remain insuperable difficulties, not to mention many other obstacles." He also pointed out that the natural approach to eastern Yunnan is from the Gulf of Tongking.

In 1908 Major Davies published his book *Yunnan*, the fruit of his three years' journeys in 1895, 1899 and 1900, when he marched over 5,000 miles, covering all the important routes, and reaching many places never before visited by a European. This book remains the most detailed and authoritative description of the country. He discusses at length all the possible routes for a road or railway, and his account confirms the difficulties reported by Baber and previous travellers. There is no way of getting from Rangoon

to the Yangtze valley without crossing somewhere the Salween and the Mekong, two of the largest rivers of Asia, which run as Baber says in abysses rather than valleys, separated from one another and from the country on either side by precipitous ranges of mountains whose passes are between 7,000 and 8,000 feet above sea-level. The Mekong, where the new road crosses it, is 4,000 feet, and the Salween is less than 2,500 feet, and these are by no means the only large rivers and mountain ranges to be negotiated, so the switchback nature of the road can easily be imagined.

The Burma-Yunnan Road

In spite of these difficulties the Chinese have succeeded in constructing a road passable by motor vehicles, at least during the dry season, from the Burma frontier to Yunnanfu, now called Kunming, the capital of Yunnan, and thence to the Yangtze at Chungking, the temporary capital of China. In December last, the American Ambassador to China motored the whole distance from Chungking to Rangoon, about 2,000 miles, in 13 days, an average of 150 miles a day, which is sufficient to prove that the road is quite fit for traffic. The most difficult part of the road is the last 350 miles from Hsiakwan to the Burmese frontier. As far west as Hsiakwan the road had been constructed three or four years ago, but the last portion was made in about eighteen months after the outbreak of the war with Japan.

Baber's description of this country and the rough contour of the road which you see here give some idea of the difficulties to be overcome, and when it is added that this 350 miles was constructed almost without any mechanical appliances, by human labor working against time, when the country was in the throes of a disastrous war, the magnitude of the task can be to some extent realized. Nobody who knows this part of the world—a tangled mass of precipitous mountains cleft by gigantic torrents, the upper waters of some of the greatest rivers in the world—can fail to be amazed at the engineering feat which has been accomplished, a feat which, with the limited means available, could only have been accomplished by the people who built the Great Wall of China.

No description of the road has, as far as I am aware, been published in any permanent form, but there have been a few accounts of it in the Press and in private pamphlets which give a good idea of it to anybody who has experience of that part of the world or of mountain roads in general.

Starting from the Burma side, the road leaves the rail-head of Lashio, about 3,000 feet above sea-level, and climbs for about 50 miles over some of the finest country in Burma, much of it open rolling downs, the highest point being about 5,000 feet. It then descends for another 50 or 60 miles to the Chinese frontier, the first two towns in China, Wangting and Chefang, being, with the exception of the Salween crossing, the lowest points on the road. From there it continues to Mangshih, about 3,300 feet, the usual terminus of the first day's run. The Burma section of the road up to mile 105 was constructed some ten years ago, and is part of the Lashio-Bhamo road, and the only new construction in Burma is the short stretch from mile 105 to the Chinese frontier at Wangting.

Mountainous Stretches

After Mangshih the real difficulties begin, the climb to Lungling, and beyond Lungling to the pass at 8,000 feet, being very steep ; and from the pass the road goes down equally steeply to the Salween bridge, which is only 2,500 feet. This bridge and the Mekong bridge are both suspension bridges of the same size, 860 meters long, and are said to be able to take a 10-ton load ; the construction of them in these inaccessible situations is a remarkable engineering feat.

From the Salween the road climbs again to Takuansse at nearly 7,000 feet, and thence drops 1,000 feet to Paoshan, where the road meets the old mule-track from Bhamo, the first large Chinese city, and the usual second night's halt. This section is easier, and it is said to be possible to do 40 miles an hour for considerable stretches. The third day's run goes down from Paoshan to the Mekong, which is crossed at about 4,000 feet, and thence by a veritable switchback to Hsiakwan, 460 miles from Lashio. Hsiakwan is the road junction for Talifu and for trade routes from Tibet, and is the most important commercial town in the west of Yunnan.

From Hsiakwan to Kunming is 260 miles, and it is possible to do this in one day, but it is more usual to stop at Chuhsiung and leave a short run of 120 miles for the fifth day. Between Hsiakwan and Chuhsiung the road reaches its highest point, nearly 9,000 feet above sea-level. From here it descends to Chenan and the last 150 miles on to Kunming is across the great Yunnan plateau varying from 5,000 to 6,250 feet, and this section of the road is comparatively easy.

Kunming, better known by its old name of Yunnanfu, the capital of Yunnan, is an important center, as the terminus of the Red River railway from Haiphong, and the junction of several roads from Szechuen and Kweichau provinces. There is a foreign population of about 500, of whom half are French, and there are several hotels with European accommodation, a luxury not to be found anywhere else on the road, though it is proposed to build inns at the principal halts. There is also at present no petrol to be obtained on the road between Kunming and the Burma frontier, so it is necessary to carry enough for 600 miles. Most of the road is still unmetalled, and until it is metalled it will only be motorable, at any rate for heavy vehicles, in the dry season from October to May. Even after metalling it will be liable to frequent interruptions from landslides in many parts.

Routes to the Yangtze

Beyond Kunming there are several possible routes to the Yangtze. In a direct line north the distance is less than 100 miles ; but the country is impracticable for a motor road, and the river is not navigable at this point, so a longer route had to be selected. The highest point on the Yangtze which could be considered for the road terminus is at Suifu, where the Min river joins it, about 400 miles from Kunming. An even longer route was, however, chosen, running eastwards to Kweiyang, the capital of Kweichau province, and thence northwards to meet the Yangtze at Chungking, the present capital of China, a distance of about 700 miles from Kunming, 1,400 miles from Lashio, and nearly 2,000 miles from Rangoon. The selection of the longer route from Kunming to the Yangtze was no doubt due to the fact that the country is easier and more thickly populated and trade prospects are better ; but what trade there has been in the past from China to Burma has been mainly raw silk from Szechuen, which comes down to Kunming or Hsiakwan from the north, and the Kunming-Kweiyang-Chungking road will not be of much assistance to this.

Not content with the construction of this road, the Chinese are reported to have already commenced the construction of a railway from Kunming westwards to Hsiakwan, to be continued to the Burma frontier and connected with the Burma railway at Lashio. The latest reports speak of its being open to traffic in a year's time, which seems incredible, even allowing for the millions of laborers whom China can produce if required. The engineer-in-charge, however, is said to have constructed another railway in China of 215 miles in ten months. The railway will apparently follow the road from Kunming to Hsiakwan, but will take a completely different route between Hsiakwan and Lashio, running south and west to cross the Salween at the Kunlong ferry, and it will be useless until the Mandalay-Lashio line is continued to this point, a distance of some 80 miles. As far as is known nothing is being done to construct this extension at present. The Burma railways are meter gauge, and it was imagined that the Chinese would make their line of the same gauge, but it is now reported that the last 280 miles to the frontier—the most difficult section—will be 0.6 meter, about 24 inches, which is narrow even for a mountain railway. The cost is estimated at $100,000,000 for labor alone, apart from imported material, for a length of 530 miles. This change of gauge will entail breaking bulk twice, and it seems doubtful if the estimated freight capacity of 300 tons a day, which is very small, will be reached. The one thing that is cheap is coal, of which Yunnan contains an almost unlimited quantity at present entirely undeveloped for lack of transport.

Commercial Prospects

How far these gigantic schemes will ever be a commercial success is open to question. Lord Curzon may have underrated the trade possibilities of the trans-Salween route, which he spoke of as only enough to fill two dug-outs, but the value of the Burma-China trade has never amounted to more than a few hundred thousand pounds in normal times. At the present moment there

(Continued on page 151)

The Netherlands Indies as a Producer of Tin

By J. VAN DEN BROEK, Mining Engineer

(Bulletin of the Colonial Institute of Amsterdam)

BEFORE proceeding to define the significance of the Netherlands Indies as a producer of tin, we will indicate briefly which position tin occupies in world-economics in general.

Tin is a metal that has been known and put to practical use for many ages. It is a generally accepted fact that the Phœnicians used it 3,000 years ago in making bronze and also traded in it. No one really knows where tin was originally discovered, but there seems reason to believe that it was in the Scilly Isles or Cornwall.

A study of statistics* shows that from 1801 to 1805 the world-production of tin was on a average 8,300 long tons annually. This production was distributed as follows:

Germany	230 tons
United Kingdom	2,721 ,,
China	2,000 ,,
Malaya	3,200 ,,
Netherlands Indies	187 ,,

In 1851 the world-production was 18,400 tons distributed as follows:

Germany	151 tons
United Kingdom	6,304 ,,
China	500 ,,
Malaya	6,000 ,,
Netherlands Indies	5,463 ,,

Hence, we see that in the middle of the 19th century there were only three important producers, namely, the United Kingdom, Malaya and the Netherlands Indies, which all produced roughly the same amount.

After 1851 we note a steady increase in production—a production which by the beginning of the 20th century (in 1901) had become 92,900 tons. This total was contributed to by the following countries:

Germany	95 tons
Italy, Portugal and Spain	45 ,,
The United Kingdom	4,600 ,,
Bolivia	12,917 ,,
Burma	49 ,,
China	3,044 ,,
Japan	14 ,,
Malaya	47,475 ,,
Netherlands Indies	15,777 ,,
Siam	3,900 ,,
Australia	5,002 ,,

These figures show that from the middle of the 19th century on the number of producers increased considerably and that Malaya in particular had grown in productivity to a remarkable degree.

After 1901 production rose still further until in 1937 it reached the peak—208,200 tons.

In that year the market price of tin was about £242 per ton which means that the value of the total amount produced in 1937 was no less than £50,000,000. This figure alone suffices to indicate the great economic significance of this metal for producer countries.

The place of tin in the different industries is indicated by the following figures relating to 1936—the last year for which complete consumption data are available.

Tin-plate	61,000 tons
Solder	31,000 ,,
Babbitt	15,000 ,,
Bronze	11,000 ,,
Foil	5,500 ,,
Collapsible tubes	11,600 ,,
Chemicals	5,200 ,,
Miscellaneous	22,700 ,,
Total	163,000 tons

A glance at the above shows that the tin-plate industry alone consumes a good 37 per cent of the total world-production of this metal.

In the year under consideration the United States consumed no less than 45 per cent of the world supply.

Now if we look at the development of the tin industry since the beginning of the present century, the following important facts emerge:

From 1900 to 1914 production still continued to rise steadily, reaching 124,000 tons in the latter year. During the world-war it remained fairly well stationary, nor did it change to any great extent during the years that followed.

But those post-war years brought a number of important technical improvements in the mechanical appliances used for production and the whole industry became more and more mechanized. The result was that on the one hand much larger capitals were invested in it than previously, and on the other that the production capacity of the industry increased considerably. Before the world war tin producing was carried on chiefly by hand. The reason for this was that by far the greater part of the tin mined was taken from alluvial deposits occurring near the earth's surface, so that they could be worked in a very primitive manner. As these easily workable ore-deposits, which had been chiefly exploited by means of Chinese labor, gradually became exhausted, a need was felt to search for and work lower deposits; and we may say that when the tin-dredge was introduced a complete revolution was effected in the tin industry. Nor were results of this revolution slow to make their appearance. Production increased rapidly and whereas in 1923 a good 125,000 tons were produced, in 1929 the figure had already reached more than 192,000 tons.

During the war, and for a short time afterwards, very high prices were paid for tin—in 1920 a maximum of £419.5 per ton was reached, but after that the market began to fall.

In 1927 a drop in prices set in which in the ensuing years assumed such serious proportions that tin producers were threatened with ruin.

As a result of the great increase in production considerable stores had, of course, accumulated. The following table will give the reader some idea of how matters stood in this respect.

	World production in 1,000 tons	*World consumption in 1,000 tons*	*Stocks (annual averages) in 1,000 tons*	*Average of annual price in £ per ton*
1925	146.1	157.8	18.6	261.1
1926	143.4	146.4	14.9	291.2
1927	158.9	150.9	16.0	289.1
1928	177.9	170.6	19.6	227.2
1929	192.6	183.6	27.2	203.9
1930	176.0	168.0	42.2	142.0
1931	148.9	140.5	55.4	118.5
1932	99.2	104.6	58.4	135.9

A second serious drop in prices occurred in 1930 and '31 and as a result the assembled tin producers from the most important tin centers concluded an agreement known as the International Tin Control Scheme, the main object of which was to restore the balance between production and consumption and reduce the enormous surplus stock. An effort to stabilize prices was also planned.

One cannot but admit—and this is internationally recognized—that the Tin Control Scheme has attained the object for which it was concluded. For a considerable time prices have fluctuated between £200 and £230, and since the International Tin Committee has sanctioned the creation of a buffer-stock, stabilization of prices—one of the objects of the agreement—has been achieved, at least temporarily. The buffer-stock is intended to serve as an emergency source of supply in case sudden needs arise during a period of increasing demand, and furthermore to support the market when unexpectedly the demand decreases to any serious extent.

One undeniable danger threatening the countries that have signed the restriction agreement is the fact that non-signatories

*The most reliable source of these is probably the compilation of the statistical department of the International Tin Research and Development Council at the offices of the Billiton Company, The Hague, Holland.

are not bound to a definite quota. If at any time the quantities produced by the non-signatories should increase considerably, the restriction scheme would undoubtedly have to be abandoned. This fact was reckoned with, however, and the possibility of such an eventuality has been adequately provided for in the agreement.

Now a word or two about the location of the tin producing countries. The most important of these are situated along the shores of the Pacific. They are the Netherlands East Indies, Malaya, Siam, Indo-China, China, Bolivia, and these may be credited jointly with 80 per cent of the world's production.

Although tin cannot be regarded as actually war material, it is of very great indirect value to war industries. In the first place it is indispensable as raw material in the production of tin-plate, which is needed for the conservation of food ; and, secondly, as a raw material for which it would not be easy to find a substitute in preparing the alloys used in the automobile and other industries. In the United States of America—by far the greatest consumer of tin, while it produces none at all—a government committee was recently appointed to report on the desirability of laying in stores of certain products (tin among others) as reserves in case at any time it should be difficult, or entirely impossible, to obtain them. The committee's conclusion was that it would indeed be advisable for the U.S. government to lay in a reserve stock.

We will now proceed from general considerations to a survey of the position of the Netherlands Indies as a producer of tin.

In order of size and importance the sources of tin-ore in the Netherlands East Indies are : the islands of Banka, Billiton and Singkep. These islands lie along the east coast of Sumatra ; they may be regarded as a geographical prolongation of Malaya and are part of the selfsame mineralized belt in which the tin ore deposits of Burma, Siam and Malaya occur. The Riouw archipelago belongs to this also. More than ten years ago one of the companies of the Billiton group found workable stanniferous deposits there, but owing to the restrictions that were made soon after this source had been discovered, actual mining of any importance has not yet started there in that locality.

As a matter of fact this same mineralized belt extends as far as the east coast of Sumatra. Sumatra's east coast is largely covered with impenetrable jungle and geological exploring has so far been merely superficial there. But no speculations as to the future of tin production in the Netherlands Indies should leave out of account the possibility of important tin deposits being found in this region.

In the Netherlands Indies, as in most other producing areas, tin is very largely mined from alluvial deposits. But for some decades Billiton has made increasingly successful efforts to obtain tin ore from the solid rock as well. Of recent years about 20 per cent of the total Billiton production has been drawn from the deep mines on that island ; in Banka, too, veins of primary ore that can be mined have been discovered.

Hence new prospects of penetrating deeper down into the earth are opening up in connection with tin production in the Indies.

In the island tin fields of the Netherlands Indies the stanniferous alluvial deposits are often of considerable size, some are known to cover the whole width of river-beds and extend for as much as ten miles, and even more. This makes a national development according to a predetermined working plan possible. In general the Netherlands Indian stanniferous ores belong to the group of rich and easily workable ores, which produce a metal of a particularly good quality ; and hence the Banka and Billiton brands of tin generally sell at a premium, fetching a higher price than the so-called " standard " tin.

Banka.—Tin production in the island of Banka dates from about the year 1710, when ore was first discovered there. In 1722 the Sultan of Palembang, to whose mighty sultanate Banka belonged, made an official agreement to reserve for the Netherlands United East India Company exclusively all the tin produced by the native inhabitants. It was during the British interregnum (1812-16), that the export and sale of tin were first checked and supervised by Europeans. In 1816 tin production was brought under direct control of the Netherlands Indies Government, the local representatives of which now took charge thereof. In 1853 the first mining engineers were appointed. The first steam appliances were introduced into the island in 1890 as a modest beginning of the thorough-going mechanization which has taken place since.

In the light of the above the history of tin production in Banka may be subdivided into four periods. The amounts of metal produced in these periods respectively illustrate the development which took place, beginning in 1718, since which date the production has been regularly recorded.

1718—1812 inclusive	70,504	long tons
1813—1853 ,, ...	109,793	,, ,,
1854—1890 ,, ...	164,052	,, ,,
1891—1937 ,, ...	658,566	,, ,,
Total production 1718 to 1937 inclusive . .	1,002,915	long tons

The above described development has led to the tin production in Banka remaining, even to the present day, a government industry. Its budget is part of the country's budget, although since the Government Industries Act of 1927 was passed it is an independent part. The highest official responsible for the affairs of the Banka Tin Mines is the Director of the Department of Public Works, assisted in this particular capacity by the Mining Service—a section of his Department. The local administration is in the hands of a government official styled Director of the Banka Tin Mines, who together with his staff is subordinate to the said Departmental Chief.

Billiton.—Tin production in Billiton began in 1852. This undertaking was very largely the result of initiative on the part of a brother of King William III, H.R.H. Prince Henry of the Netherlands.

Vincent Gildemeester Baron van Tuyll van Serooskerken and John Francis Loudon vigorously supported the Prince in his efforts, and to them was given, in 1852, the first mining concession in the Netherlands Indies. By this concession they acquired the right to exploit all ore deposits found on the island of Billiton.

During the initial period of its existence the enterprise was beset with many difficulties. In 1860 the concession, burdened as it was with a considerable debt, was merged by the pioneers in a company established for the purpose under the name Billiton Company Ltd. The years immediately succeeding the establishment of this company were so full of trouble that at a certain point liquidation was contemplated. But just then a rich deposit was found and in 1868 the company was able for the first time to pay a dividend—4½ per cent—on its capital of five million guilders. Since then it has almost always been able to pay considerable dividends, the highest of which was 82.2 per cent in 1888. Only once, namely, in 1921, no dividend was forthcoming.

In 1892 the government extended the Billiton Company's concession but imposed more stringent terms. From now on the company was required to hand over to the government $\frac{5}{8}$ of its net profits.

The concession of 1892 was to expire in 1927. The extension thereof was the subject of a stormy debate in the Netherlands parliament, which, in 1917, refused to accept a proposal to extend the term.

A solution was finally found in the fact that in 1924 the Netherlands Indian Government and the Billiton Company established a Joint Mining Company Billiton (Gemeenschappelijke Mijnbouwmaatschappij Billiton). Five-eighths of the share-capital of the new company totalling 16,000,000 guilders, or 10,000,000 guilders, was allotted to the Government and three-eighths (6,000,000) to the Billiton Company. Hence the latter receives $\frac{3}{8}$ of the profits from tin producing in Billiton as it did in the time of the 1892 concession, only now this is paid to it as a shareholder.

Since 1924, then, the Billiton Company no longer runs the Billiton mines directly, as these are worked by the joint company. The Billiton Company has, however, been entrusted with the executive management of the G.M.B., subject to the supervision of a Managing Council composed of five members, three appointed by the Minister for the Colonies and two by the Billiton Company.

The total output of the Billiton mines from 1853 to 1937 inclusive is 409,022 long tons.

Singkep.—Systematic tin production in Singkep dates from 1887 when the government granted the Singkep Tin Company a concession there for this purpose.

In 1933 this company sold its concession and the entire concern to the Billiton group, which vested it in a new limited company entitled the Singkep Tin Exploitation Company " Sitem." The capital invested in the company is entirely in the possession of the G.M.B., except for one share which is owned by the Billiton

Company. The Billiton Company is entrusted with the management under supervision of a Board of Directors, composed of the members of the Managing Council of the G.M.B. Hence tin production at Singkep has been in the hands of the G.M.B. since 1933.

Production in Singkep from 1887 to 1937 inclusive totals 32,889 long tons.

The Technique of Tin Producing.—As a rule alluvial tin ore occurs in a layer several inches in thickness in which most of the ore appears in more or less concentrated form. This layer is found from several meters to several dozen meters under the earth's surface. Therefore to reach the tin ore, sometimes called "pay dirt," the overburden has to be removed.

The tin ore not infrequently contained therein must be extracted by eliminating the lighter components by what is known as washing. Then the concentrated layer of ore, from which the almost pure cassiterite (SnO_2) is obtained, can be scooped out.

At an earlier period this tin producing was done by hand. Chinese labor was, and still is used, because the Chinese are better able to stand heavy mining than the indigenous Malays.

About 1910 the gravel pump was introduced in Billiton, which at this time meant a very considerable step towards mechanization, and then came the monitor. The main advantage of the gravel pump is that it eliminates the need for human labor for transportation and replaces this by water made to run over the working face. The laborer breaks up the soil and sees to its being deposited in the stream of water. Very soon it was discovered that even this last remaining hand labor could be dispensed with by breaking away the soil by means of a powerful jet of water, whereby the material is landed in the flowing stream.

The necessary power was furnished by steam boilers and steam engines.

But the greatest step in the direction of complete mechanization was the introduction of bucket dredges. The first of these appliances was set up at Billiton in 1920. This dredge does away almost entirely with hand work. The new dredges include facilities for washing the ore mechanically on jigs and concentrating tables.

To give the reader some idea of a modern bucket dredge we may state that Billiton's latest one—the Karimata—boasts a pontoon measuring 75 by 23 meters and can dredge to a depth of 30 meters. It is able to move 3,000,000 cubic meters of material annually, and as it stands in Billiton it is worth more than 2,000,000 guilders.

Billiton and Singkep have at their disposal jointly eighteen bucket dredges and three hydraulic monitors, representing a total capacity of 32,000,000 cub. meters per year. Banka owns ten bucket dredges. A dredge run by 150 men working in three eight hour shifts, moves as much material as was previously moved by four to five thousand workmen. The result of this mechanization has been a considerable reduction in the number of hands employed.

Obtaining primary ore from the solid rock amounts to deep mining. Underground the tin ore veins are followed.

In the Klappa-Kampit mine in Billiton the deepest level found is one at a depth of 300 meters. Naturally operations here have also been very much mechanized.

Modern methods of production have greatly reduced the cost-price of tin, and many mining areas which could previously not be made to pay have thus been drawn within the limits of what is possible in this respect. Mechanization has one advantage which is particularly important in these days of restricting production and quotas, namely, that it introduces great elasticity into a business, in that it makes it comparatively easy to close down part of the works temporarily, for the purpose of restricting production until such time as it may be increased again.

Smelting.—The tin ore mined in the Netherlands Indies is smelted partly at Banka and partly at Arnhem, in the Netherlands. At the latter place the work is done by the Holland Metallurgical Works, Ltd. At this company's plant—which boasts every modern improvement and is, perhaps, at present the most up-to-date in the world—is smelted not only the ore produced in the Billiton and Singkep tin fields, and part of that found on the island of Banka, but also ore from Bolivia, Spain, Portugal and Africa. Further the Company buys up all sorts of tin ashes and converts these into marketable metal once more.

As the Joint Mining Company Billiton is a shareholder in the Holland Metallurgical Works, the Netherlands Indies Government receives considerable revenue in the form of dividends from this Netherlands industry.

Not long ago a community of interests was established between this company and Consolidated Tin Smelters, Ltd., with plants at Liverpool and Penang. By this group and the Netherlands Indies jointly 70 per cent of the world's tin smelting is done at present.

The Netherlands Indies' Share in the World Production of Tin.—The Netherlands Indies rank third in the list of tin-producing countries, Malaya and Bolivia taking first and second place. In 1936 and 1937, when Bolivia's production lagged behind, the Netherlands occupied the second place. For a few years previous to international co-operation, her share of the world's output was 18 per cent.

Since the introduction of international tin control the relative percentages of the different countries—at least of those that participated in the agreement—have remained fairly constant. The "standard tonnage" of the Netherlands Indies is almost 19 per cent of the standard tonnage of the different signatory countries combined. Her share of the total world production is less, however, since the latter includes what outside countries produce, and this amounts on an average to 15 per cent of the whole.

Restriction has also stabilized the relation subsisting between Banka on the one hand and Billiton-Singkep on the other at 59 per cent for the former and 41 per cent for the latter. Netherlands Indian production reached its highest point in 1937 at 39,825 long tons. As a result of restriction regulations the output fell to only 21,024 long tons in 1938.

The Significance of Tin Production to the Netherlands Indies Government.—The first thing that strikes one in comparing tin production in the Netherlands Indies with that same industry in other countries, is that the former is in the hands of only two bodies—the government enterprise on the island of Banka and the joint enterprise known as the G.M.B. now operating in Billiton and Singkep. The next thing that strikes the observer is the scope of the direct part played by the government in tin production. The Banka works are government-owned and the government holds the greater part of the shares in the G.M.B. and appoints the majority of the members of its Managing Council.

As a source of revenue for the Netherlands Indies Government tin plays an extremely important rôle. In 1937 the profit of the Government-owned Banka mines was about 26 million guilders. The profit of Gemeenschappelijke Mijnbouwmaatschappij Billiton and Singkep combined was a good 11 million in that year. As a shareholder the Government has a right to five-eighths of the latter sum or about seven million; further G.M.B. and Singkep paid in 1937 about three million guilders to the Government in the shape of limited company tax and one million in export duties, mineral duty, etc., hence a total of about 11 million. Had not part of the profits of both the Banka Mines and G.M.B. been reserved then the Government could, in 1937, have actually received 26+11=37 million guilders from Indies tin production.

During those particularly fruitful years, 1926 and 1927, Banka paid to the government a net profit of 56 and 49 million guilders respectively. Besides this the Government received from the G.M.B. 9.5 million guilders in 1926 and 10.5 million in 1927 as its five-eighths of the proceeds of the business plus the limited company tax.

As the above figures show, revenues obtained from tin play an important rôle in the budget of the Netherlands Indies, which in 1937 amounted to about *f* 500 million for the ordinary service in receipts and disbursements.

But as a source of Government income tin involves a certain danger, because during times of depression, when revenue is most needed, it is apt to fail the exchequer to a great extent. With a view to stabilizing the receipts from tin as much as possible, measures were taken in 1932 for forming a Banka profit reserve fund. The arrangement is that the sum paid out to the government shall not exceed *f*15 million a year, the surplus profits being put into the reserve fund. This is to be kept up until the latter totals *f*35,000,000. The object of the fund is to ensure the payment to the government of the usual *f*15 million, or as nearly that sum as possible, during unfavorable years.

The G.M.B., having been run on the usual commercial basis from the very first, has long been at work to achieve the same object by means of its dividend and reserve policy. This has not only meant that the income of shareholders has been more or less stabilized but it has also had the advantage of providing

(Continued on page 155)

The Diesel-Powered Railcar on Secondary Lines

In the development of the high-speed, powered railcar, a field of engineering in which remarkable progress has been made in the past fifteen years, railway technicians and builders learned early the economies and the immense values of close sequence in production operations beginning with the power plant. Adherence to this principle resulted in a unification and standardization of designs that not only improved and speeded up practical operation of railcars, but also made possible economies that could have been realized in no other way. Many of the failures that were recorded in the early days of powered railcar production are to be attributed directly to disregard of this principle.

From the beginning the great firm of Maybach-Motorenbau of Friedrichshafen, who have built Europe's fastest trains in operation in Germany, Sweden, Holland, Belgium, France and Spain, have been closely identified with the evolution of the high-speed powered railcar. The success this firm has attained in railcar production was built upon years of practical experience and on production of standard types of railcars for the German State Railways. Maybach engine plants with vertical engines that were originally placed in service on the secondary lines of the German State Railways illustrate important phases of the developments that has been achieved in this field. The importance of the powered railcar in secondary line service of the Reichsbahn is shown by the fact that the number of railcars placed on the secondary lines from 1934 to 1938 was increased more than two times.

In a preceding article* reference was made to the first occasion on which the first high-speed Diesel engined railcar was exhibited. This was at the Seddin Railway Exhibition held in 1924. At this Exhibition an eight-wheeled vehicle that had been built by the Waggonfabrik Wismar and Maybach-Motorenbau was shown. It attracted special attention not only because it was equipped with the first high-speed railcar Diesel engine, designed specifically for railcars, but also owing to the four-speed mechanical Maybach gear box, evolved by Maybach for railway needs. This early powered railcar included all of the essential elementary features that entered into the future development of the railcar. In the years that followed this Exhibition a number of railcars of this type in four different series (*see* Fig. 1) were put into service on the German State Railways. The types of this series differed in exterior appearance, arrangement of passenger compartments and design of bogies. As regards engine equipment and accessories the four series were identical.

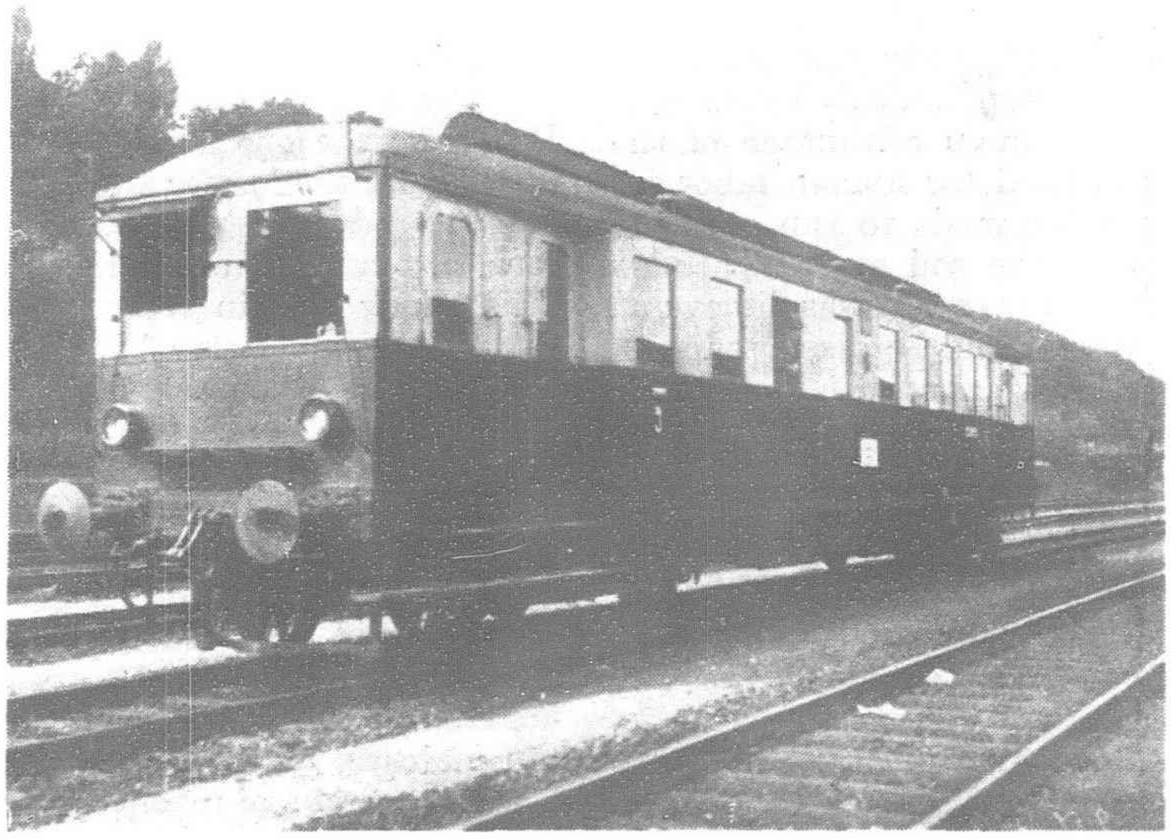


Fig. 1.—Original type of the 8-wheeled Diesel mechancial secondary line railcar with 150-175 h.p. Maybach Diesel engine

Further Improvements

At this stage of development of the Diesel powered railcar the high flexibility of engines, so necessary in mechanical transmission, could be obtained only from fuel injection by means of compressed air. For this reason, the first Maybach railcar Diesel engines were of the compressor type. They were 6-cylinder engines with a bore of 140 mm. (5½-in.) and a stroke of 180 mm. (7 1/16-in.) developing 150 h.p. at 1,300 r.p.m. By further developing the injection valves and the piston form, it was soon possible to improve combustion so that an output of 175 h.p. at 1,400 r.p.m. could be attained. The Maybach four-speed gear box, especially developed for railcars, transmitted the engine torque to the axles. The whole power set was mounted on a bogie. Only the Diesel engine projected into the coach body, designed in this space as an engine room. Each gear step was provided with a clutch having multiple laminated disks operated by forced lubrication. The two axles of the power bogie were driven by a loose axle through coupling rods. The control of engine, gear box, and reverse gear was effected by poll cables.

It is to be recorded that these secondary line railcars now have been in service more than ten years. The first of them has run a

**Far Eastern Review*, February, 1940.

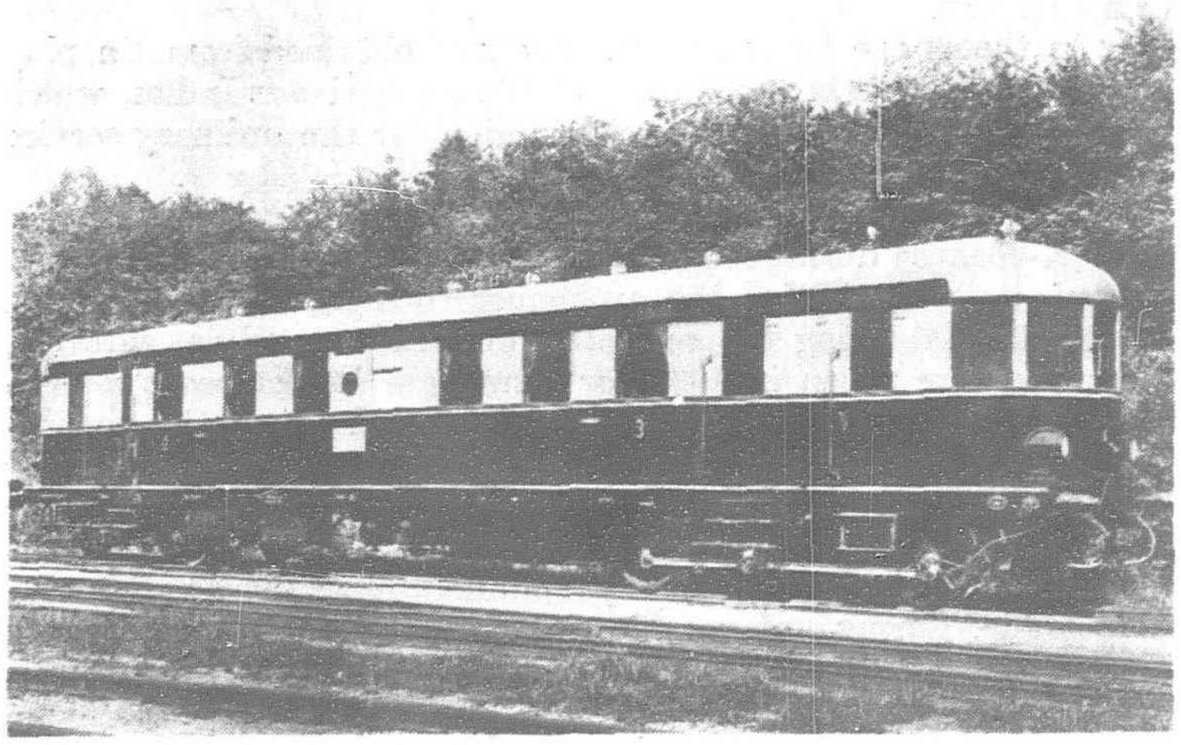


Fig. 2.—Second type of the 8-wheeled Diesel mechanical secondary line railcar with 175 h.p. Maybach Diesel engine

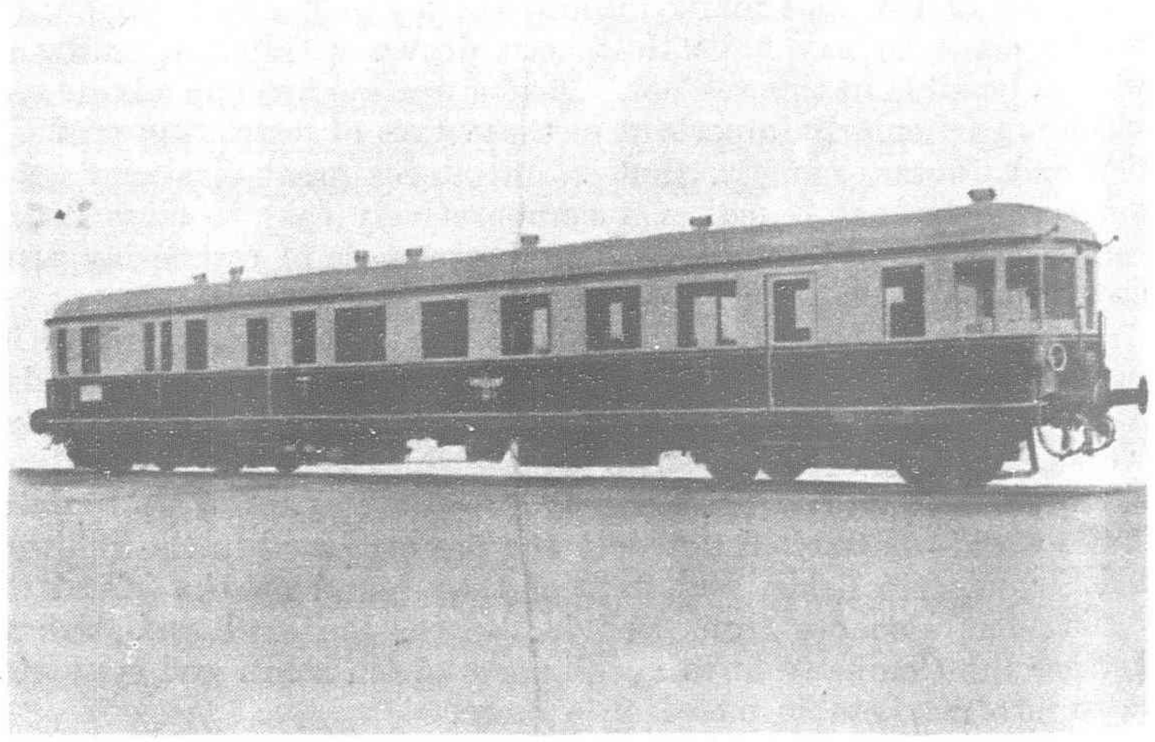


Fig. 3.—Eight-wheeled railcar with 225 h.p. Maybach 6-Cylinder Diesel Engine and Hydraulic transmission on the Voith-Maybach system

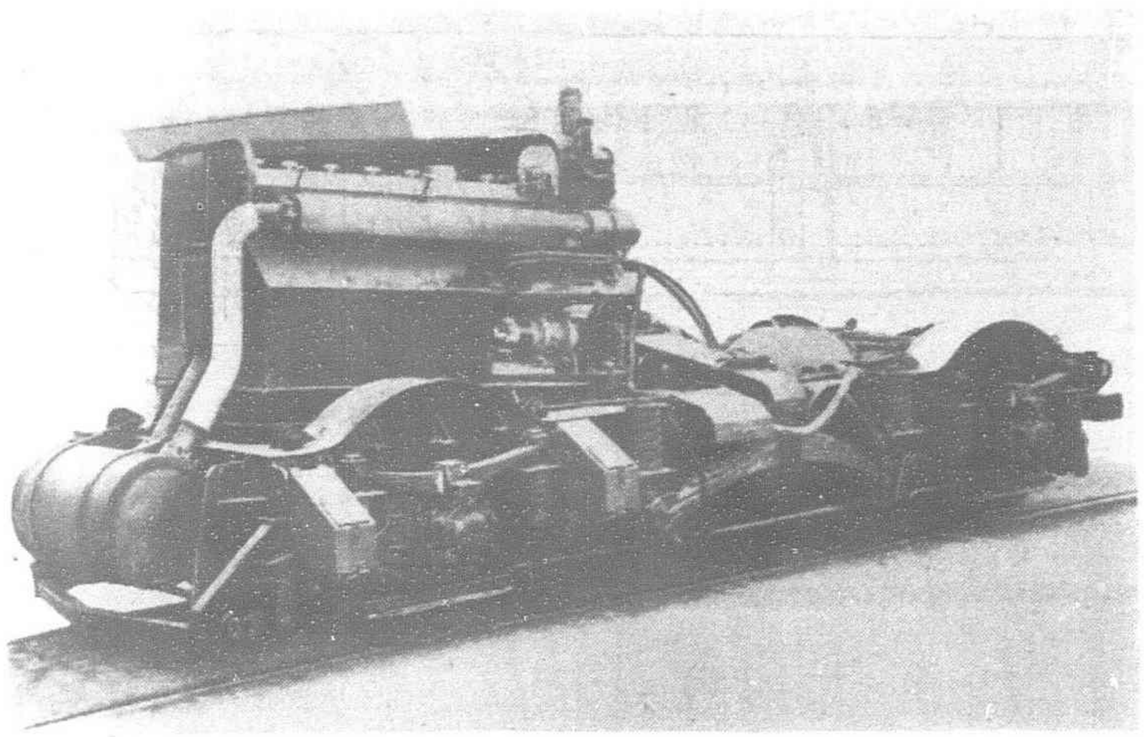


Fig. 4.—Power bogie of the 225 h.p. railcar

million kilometers (621,380 miles). The next phase in the development of the secondary line railcar involved an increase of efficiency by reducing weight. In operation with passengers the railcars mentioned weighed 43 and 47 tons and had a maximum speed of 60 km. p.h. (37 m.p.h.) and 65 km. p.h. (40 m.p.h.), respectively. Owing to lesser weight of new vehicles that were produced maximum speed was increased to 80 km.p.h. (50 m.p.h.). The first series of this so-called light structured type was supplied in 1932 and in all 25 vehicles were delivered. One of these railcars weighed approximately 37 tons when carrying a full load of passengers. The front end of the car was tapered and rounded as a characteristic external feature, Fig. 2. Apart from some small modifications caused by increased speed, the original power plant of the first vehicles was maintained, but all its parts were improved as a result of experience that had been gathered in practical service. One novelty that was introduced was the arrangement of the radiator suspended from the subframe of the vehicle.

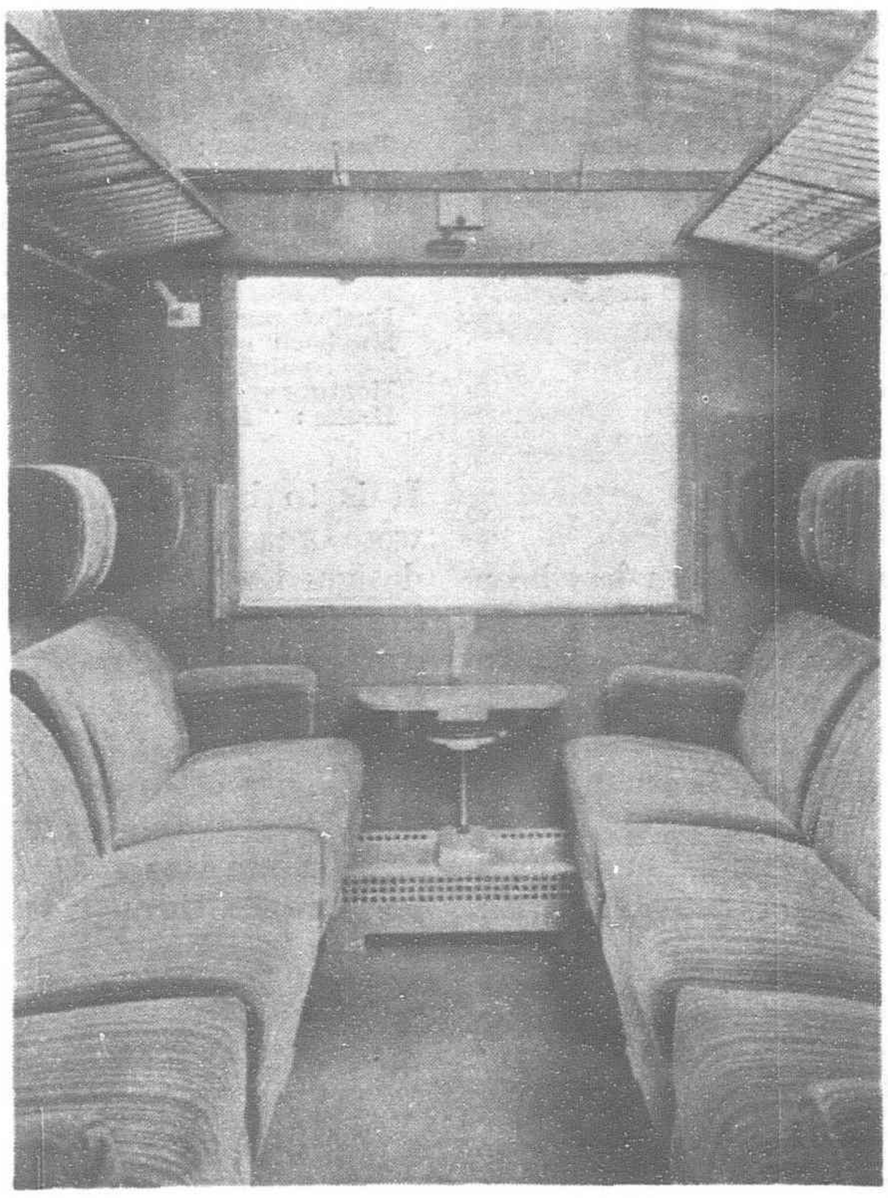


Fig. 5.—Second class passenger compartment in the 225 h.p. railcar

It was recognized that arrangement of radiators on the roof detracted from the appearance of the vehicle and caused the coach body to become heavy. Besides, the efficiency of such cooling groups is not impressive and the electrically-driven fans required are heavy and costly. Therefore, the location of the equipment beneath the floor of a car was deemed desirable. This made possible the drive of the ventilator mechanically from the mechanical gear box through a cardan shaft.

The Subframe Radiator

The subframe radiator was maintained in the course of later developments of railcars on the German State Railways, and in following years its capacity was notably increased. Maybach-Motorenbau achieved further improvements and at length produced a design that is now prescribed by the Reichsbahn as a standard type even for power sets of other makes. Based on the experience obtained with the 175 h.p. engine the now well-known Maybach 12-cylinder 410 h.p. V-engine was developed for main line railway service. This engine was built on the approved design of the 6-cylinder engine, working, however, on the airless fuel injection system. As this engine gave satisfactory service it became desirable to use solid injection engines for drives on secondary line railcars also. This aim was achieved in the construction of the Maybach 6-cylinder engine GO 5 h—(in a sense half of the 12-cylinder engine)—set to give an output of 210 h.p. at 1,400 r.p.m. from 150 mm. ($5\frac{7}{8}$-in.) by 200 mm. ($7\frac{7}{8}$-in.) cylinders. Thus Maybach-Motorenbau carried forward the development of the 6-cylinder railcar Diesel engine so that for the 6-cylinder engine as well as for the 12-cylinder the same structural parts are used to a large extent. In practical service this proved highly advantageous, for the 6-cylinder as well as the 12-cylinder engine can be put to work at a service center without additional expense of consequence for crew training, storage of spare parts and repair shop fittings. It became possible, therefore, to use two different vehicle types on main or secondary lines without additional extra work or expense at service centers. It is to be observed that experience gained practically with one type proved of direct benefit to other types.

In 1934 and in 1935, 34 secondary line railcars equipped with a new Maybach 6-cylinder engines were placed in service by the German State Railways. The external appearance of these vehicles fitted with airless injection 210 h.p. engines differed but slightly from the so-called light structure type outlined above. The new vehicles of 31 tons have a maximum speed of 80 km. p.h. (50 m.p.h.).

The elementary portions of the new power-set were identical with those of previous types. However, to attain the highest possible reliability and service, improvements in the power set were made in all its parts and desirable changes in form were made with some accessories. The improvement and development of the Maybach railcar Diesel engines has been a continuous process. After supplying numerous railcar power sets for railways in Germany and many other countries, the experience gained from the first fast railcars of the Reichsbahn, the adoption of supercharging for Diesel engines and other developments procured a fund of general recognition, and all this experience has had special value in the production of Maybach power sets to be used mainly on secondary lines. An outcome has been the construction of the 6-cylinder engine type GO 56 h. developing an output of 225 h.p. at a speed of 1,450 r.p.m. The cylinders are 160 mm. ($6\frac{5}{16}$-in.) bore by 200 mm. ($7\frac{7}{8}$-in.) stroke (half the GO 56 type). This engine has central fuel injection. As to other component parts, for example, running parts, considerable improvements have been achieved.

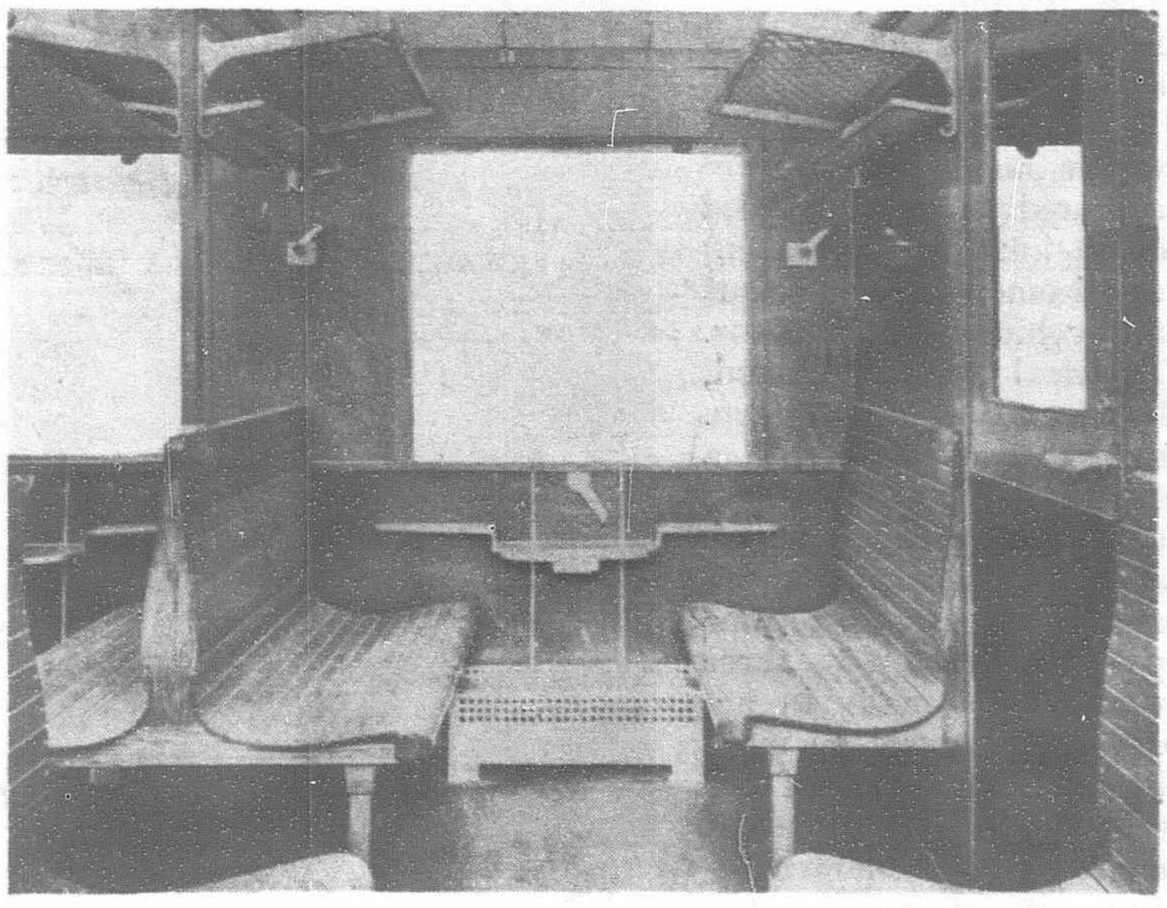
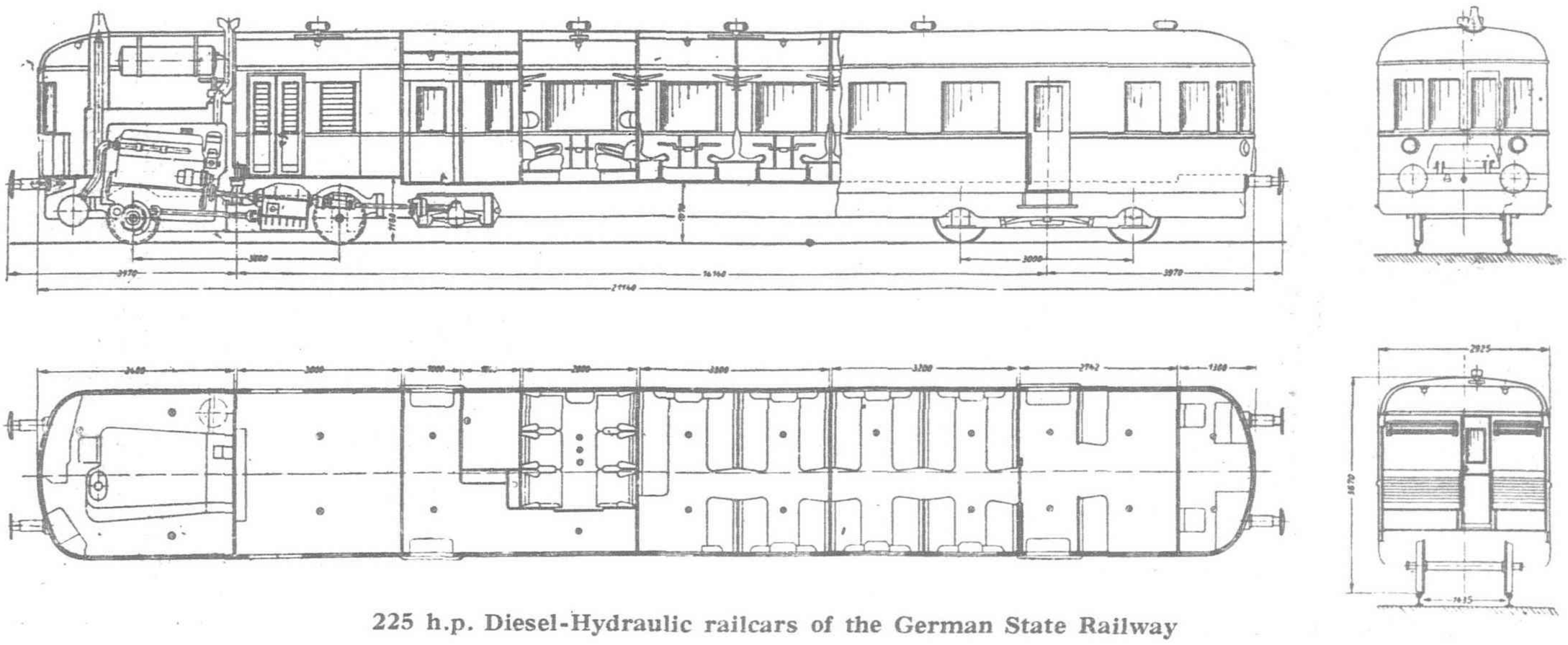


Fig. 6.—Third class passenger compartment in the 225 h.p. railcar



225 h.p. Diesel-Hydraulic railcars of the German State Railway

Overall length (over buffers)	22,080 mm. (72′ 5″)
Tread diameter of the wheels	900 mm. (3′)
Maximum axle spring deflection	35 mm. (1 3/8″)
Cradle spring displacement	60 mm. (2 5/16″)
Seating accommodation, second class ..	6
Seating accommodation, third class ..	43
Number of emergency seats	9
Weight of the railcar in working order .. .. .. approx.	37 to (36.4 tons)
Maximum speed	80 km/h (50 m.p.h.)
One driving position at each end of the car	
Coach builders: Westwaggon, Köln	
Busch, Bautzen	
Düsseldorfer Waggonfabrik	

Engine: 225 h.p. Maybach railcar Diesel engine, 6-cylinder arranged in one row. n = 1,450 r.p.m. weight 1,300 kg. (2,866 lbs.) bore = 160 mm. (6 5/16″) stroke = 200 mm. (7 7/8″).
Transmission: hydraulic, on the Voith-Maybach system, the first axle being driven by the Voith reversing gear.
Control: electric, on the standard scheme of the German State Railway. Multiple-unit control with supervision of two engine plants from each driving position.
Performance graduation: five steps with engine speeds of 1,100, 1,200, 1,300, 1,380, 1,450. Idle speed 600.
Fuel storage: 660 litres in two tanks.
Maybach standard cooling group for the re-cooling of the engine cooling water.
Heating system: hot water heating by a coke oven below the floor.
Brake: "Knorr" compressed air brake.

An Uninterrupted Advance

Since 1924 the development of railcar transmission has been continuous. Most noteworthy, the hydraulic gear box has been introduced in railcars. Just as in the cases of electrical transmission and the mechanical gear box, this transmission system has been developed in such a way that the approved principle of the bogie-mounted engine could be maintained. In 1936 the German State Railways introduced on secondary lines 40 8-wheeled Diesel-hydraulic railcars designed along lines of development mentioned (*see* Figs. 3 and 8). These vehicles have been provided with a Maybach 225 h.p. 6-cylinder Diesel engine with the hydraulic transmission on the Voith-Maybach system. The design of the power set and arrangement of all accessories have been practically similar to previous types. The hydraulic gear box has replaced the mechanical gear box.

In the service for which the 40 railcars were acquired a maximum speed of 80 km.p.h. (50 m.p.h.) was deemed to be sufficient for vehicles of 35 tons. Practical service proved, however, that the 225 h.p. railcars could run with a speed of 90 to 100 km.p.h. (56 to 62 m.p.h. without affecting the power set adversely. Thus it became possible to employ these vehicles optionally in accelerated service on main lines. The layout of the railcars and the principal constructional characteristics are shown in the accompanying drawing.

It is to be mentioned that all accessories of the engine plants were made and supplied by Maybach-Motorenbau or were designed with their assistance. As mentioned above, the German State Railways have specified the Maybach radiator for the re-cooling of engine water as a standard cooling group. This has been installed in the 225 h.p. railcar, Fig. 9.

The method of admission of combustion air to Diesel engines has points of interest. Numerous observations in service proved that wear in the engine cylinders diminished greatly if the combustion air was taken from above the roof under a small over-pressure led through the fresh air duct to the engine. This is due

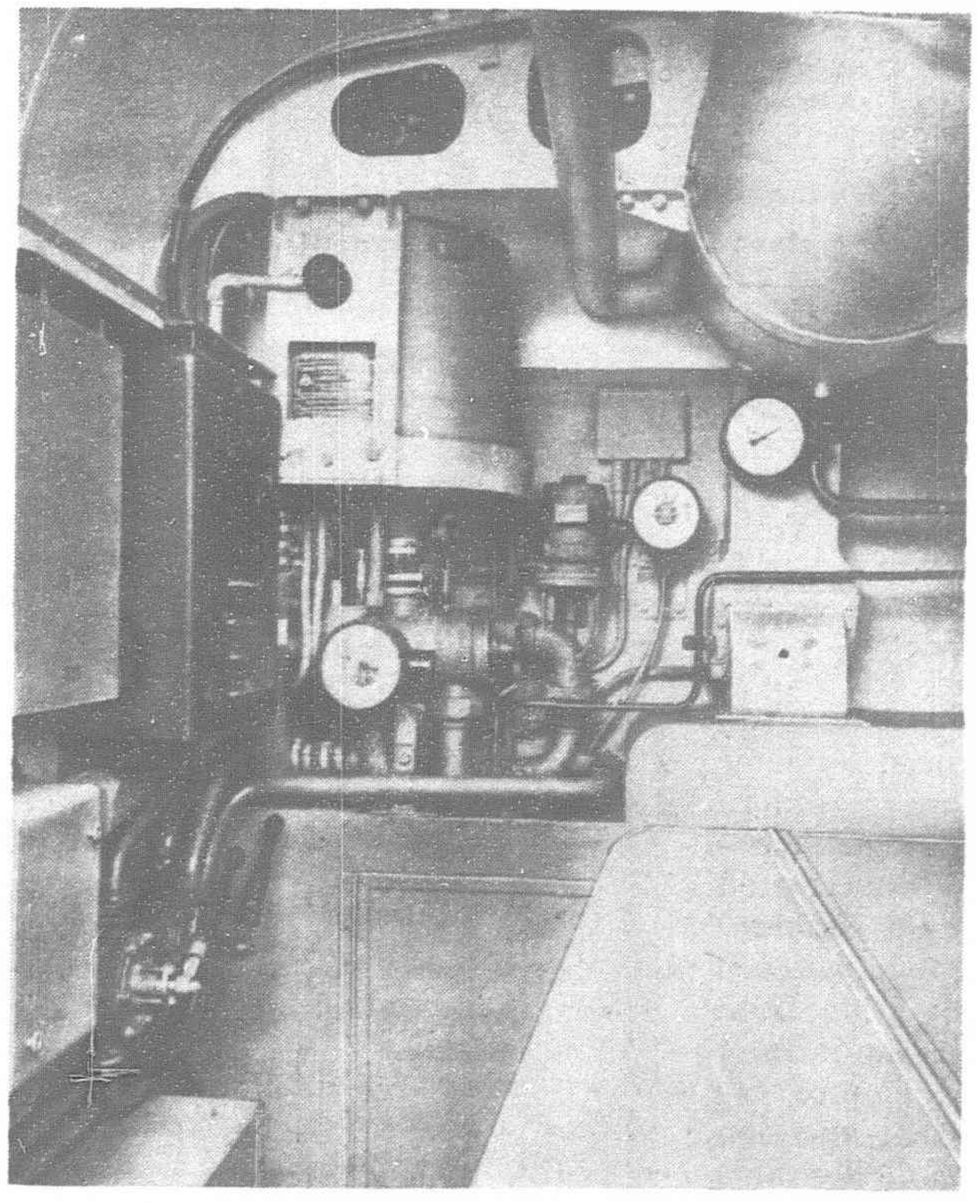


Fig. 7.—Corner of the engine room on the 225 h.p. railcar with equipment for cooling water circulation of the engine

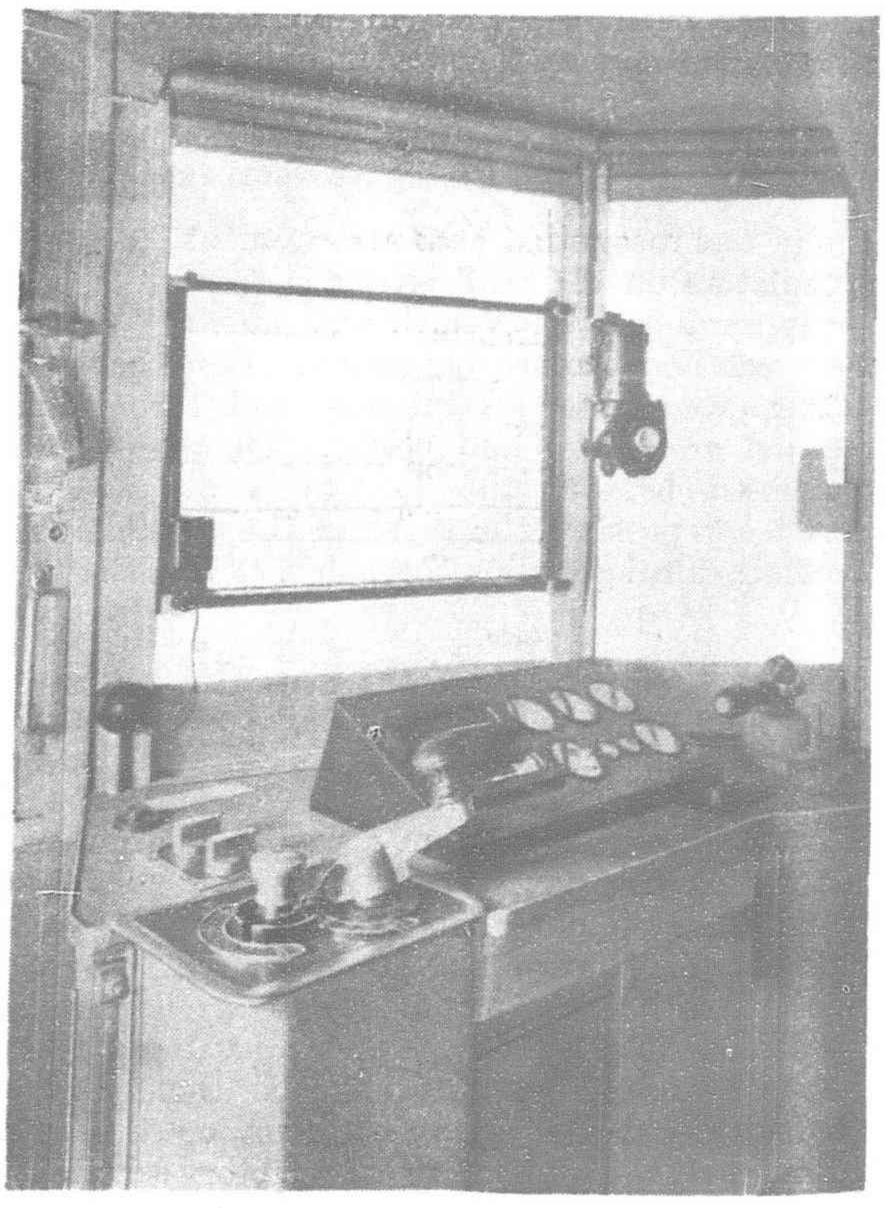


Fig. 8.—View of the front driving cab in the 225 h.p. railcar with control instruments for two power sets

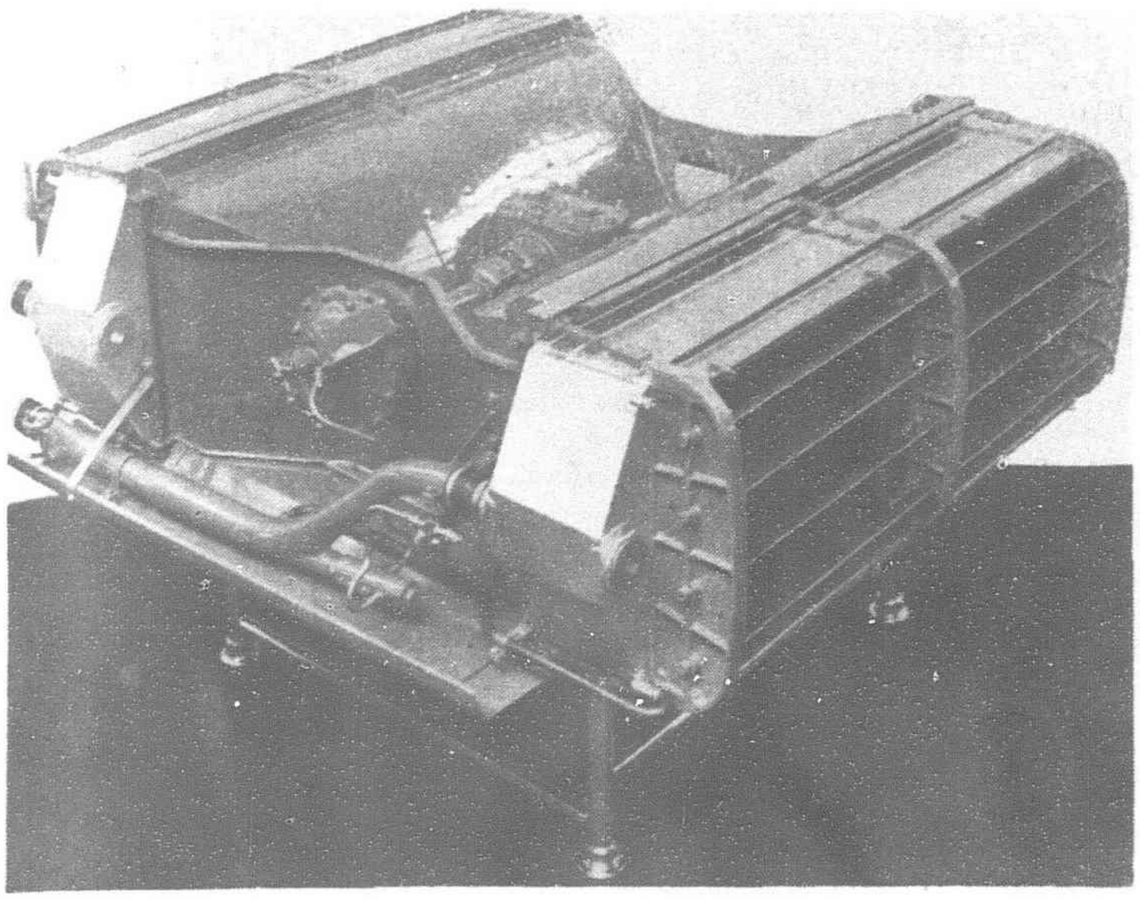


Fig. 9.—Maybach cooling group for railcars, Type KG, Standard on German State Railways

to the fact that the air over the roof of the car relatively is little vitiated with dust. Moreover, the small over-pressure in the engine hood prevents the brake dust from entering the engine. It may be seen from the drawing that an engine air intake has been fitted to the roof supplying the combustion air for the engine from this source.

Electric Remote Control

Certain problems were created by ever-increasing traffic on main and secondary lines in overcoming traffic peaks on the German State Railways. A factor in this problem was that railcars with differing transmissions had been placed in operation. Accordingly, an electric remote control had to be developed applicable in principle to all transmission systems. The 225 h.p. railcars had been equipped with such an electrical control. This system makes it possible, for example, to run such a railcar combined with the main line Diesel electric railcar of a higher output in remote control (Figs. 7 and 8). As set forth, the maximum speed of the 225 h.p. railcars can be increased, and they can, therefore, easily be adapted to main line schedules.

Further progress in railcar development is seen progressing in the fact that 25 power sets are under construction by Maybach-Motorenbau for the German State Railways. By improving combustion the output of these new Maybach 6-cylinder railcar Diesel engines can be increased to 250 h.p. at a speed of 1,500 r.p.m. (*see* Fig. 10). As the German State Railways are using both mechanical and hydraulic transmission systems on secondary line railcars, a number of the new power sets will be constructed for mechanical transmission. However, the set will be designed in such a way that the bogie for mechanical as well as for hydraulic transmission can be placed under the same coach body.

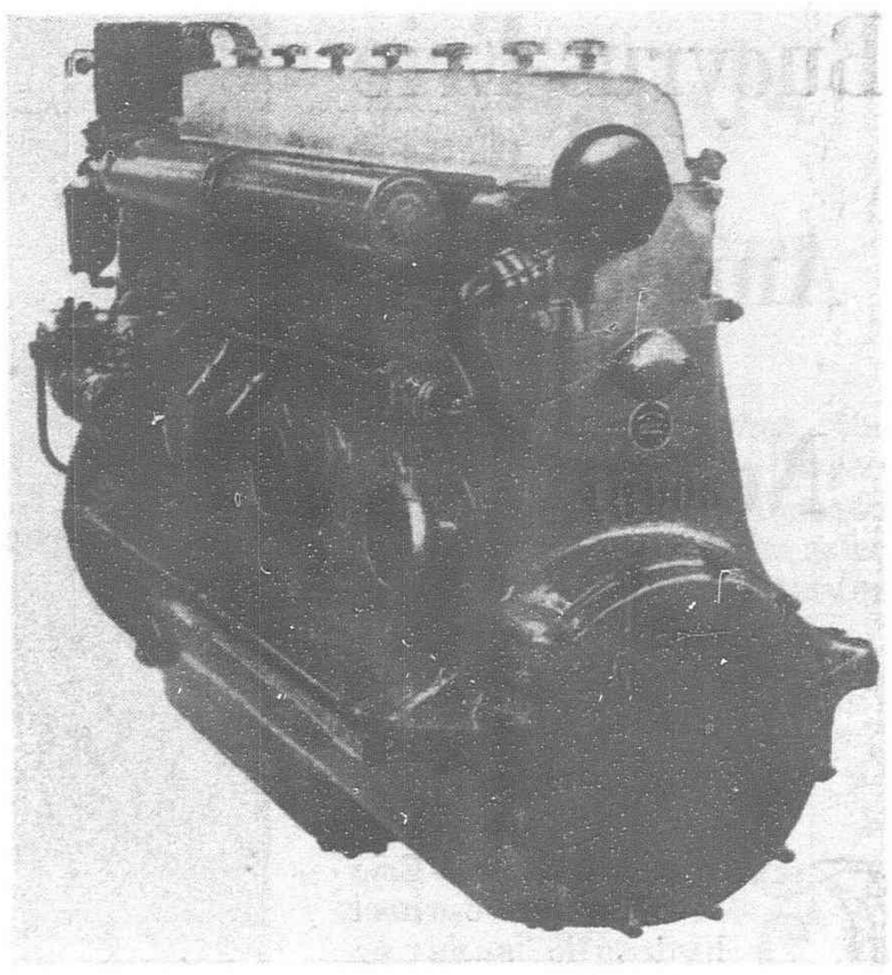


Fig. 10.—Maybach 6-cylinder Diesel engine type G 56h, seen from vibration damper end

This description shows how, beginning with the Railway Exhibition at Seddin in 1924, modern and reliable secondary line railcars gradually have been created. These vehicles have come up to highest expectations, and they combine such a multitude of experiences that excellent results in service must be a matter of course.

Hsinking, Capital of Manchoukuo

(Continued from page 141)

The administration of Manchoukuo is nominally vested in the person of the Emperor. The actual administrative work is carried on by the State Council, presided over by the prime minister, with the sanction of the Emperor. Important revisions in the administrative system were effected and enforced from July 1, 1937, with a view towards facilitating the work of the national program and to secure the best possible efficiency in the task of building the state.

In the matter of local administration, the State is divided into 18 shengs or Provinces, one Special Municipality.

Aside from an ordinary sightseeing route, a trip to Nanling Electrified Farm, which is being carried on under the joint management of the S.M.R. Hsinking Office and the Manchuria Electric Company, is highly recommended to visitors who are interested in agriculture.

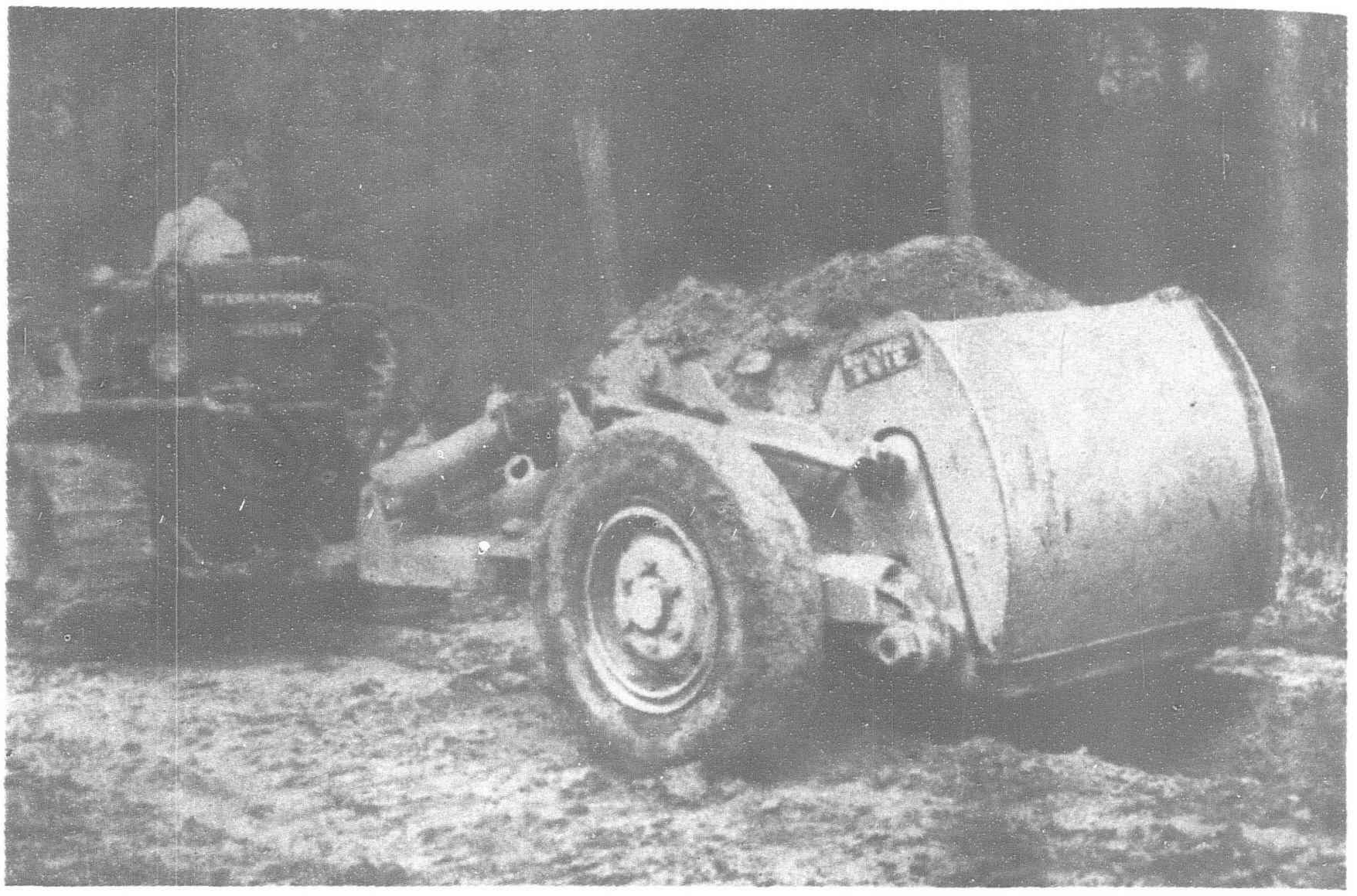
Within an hour's journey on the Hsinking-Tumen Line one will reach Kyudai Spa, a picturesque resort at all seasons of the year. The Spa is abundantly blessed with colorful Manchoukuoan charms temptingly inviting the visitors with promise of an enjoyable day in surroundings totally different from those of the work-a-day world. Comfortable accommodations may be had at the hotel, and an unrivalled panoramic view of the surrounding mountain scenery can be enjoyed.

Burma and Her Land Communications

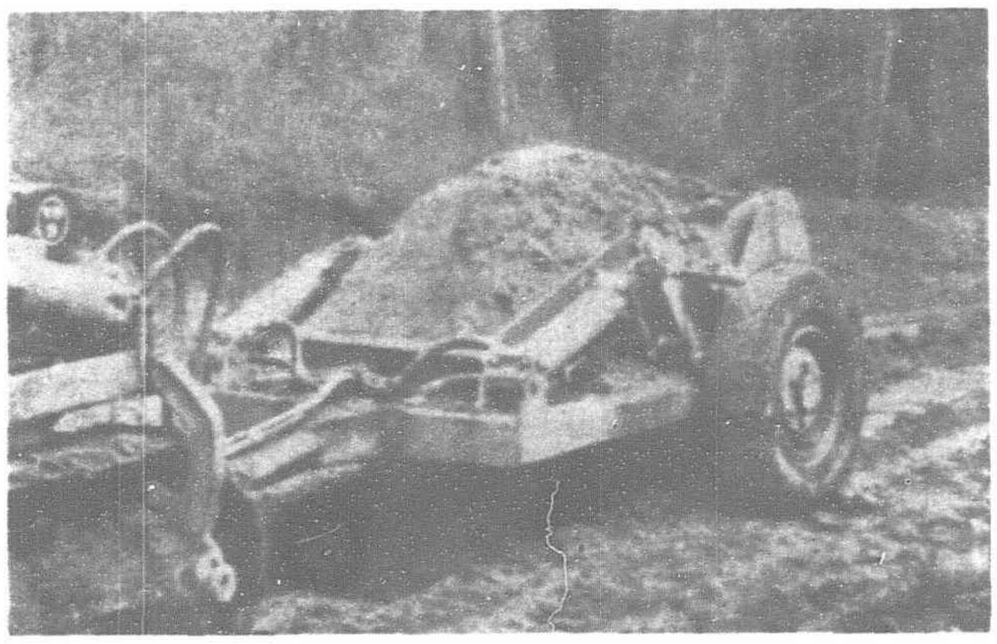
(Continued from page 144)

is a demand for munitions due to the closing of the Chinese ports, but this is presumably only temporary, and whether in peace-time trade will justify the cost of construction and maintenance of the road and railway seems doubtful. Western Yunnan is a poor and thinly populated area, and the natural outlet from Kunming is down to the east. The Red River railway to Haiphong, which was built at the beginning of this century, is about 550 miles, almost exactly the same distance as Lashio to Rangoon, and the extra cost of freight to Rangoon, which is more than twice as far from Kunming, is going to be a very severe handicap. Also it must be remembered in considering this road as a back door into China, and not merely as a link between Burma and the two provinces of Yunnan and Szechuen, that Chungking itself is very isolated. It is 600 or 700 miles from the nearest railway at Hankow, which lies as far to the east of it as Kunming does to the west. Distances in China are so great that it is difficult for us to realize them, but the population and the possibilities of future trade when the country is opened up are also incalculable. There are doubtless men still living who thought the idea of trans-American railways linking the Atlantic to the Pacific was fantastic. Perhaps there are also men living who will see trans-China railways linking the Pacific to the Indian Ocean.

Bucyrus-Erie Announces New H-28 Scraper



THE new Bucyrus-Erie H-28 is a two-wheel hydraulic scraper built for use with tractors rated at 25 to 35 horse-power. It has a struck capacity of 2½ cubic yards but will, according to the manufacturer, heap to loads of three or four cubic yards. Since the H-28 with its tractor can be loaded on a regular truck and hauled within usual dimension and load limits, no special permit is needed to haul it over the highways; thus it becomes especially handy for work involving fast moves from job to job. The H-28 can also be used with a rubber-tired tractor, making a complete dirt-moving and traveling layout and a high speed all-on-rubber hookup that will not damage hard-surfaced roads.

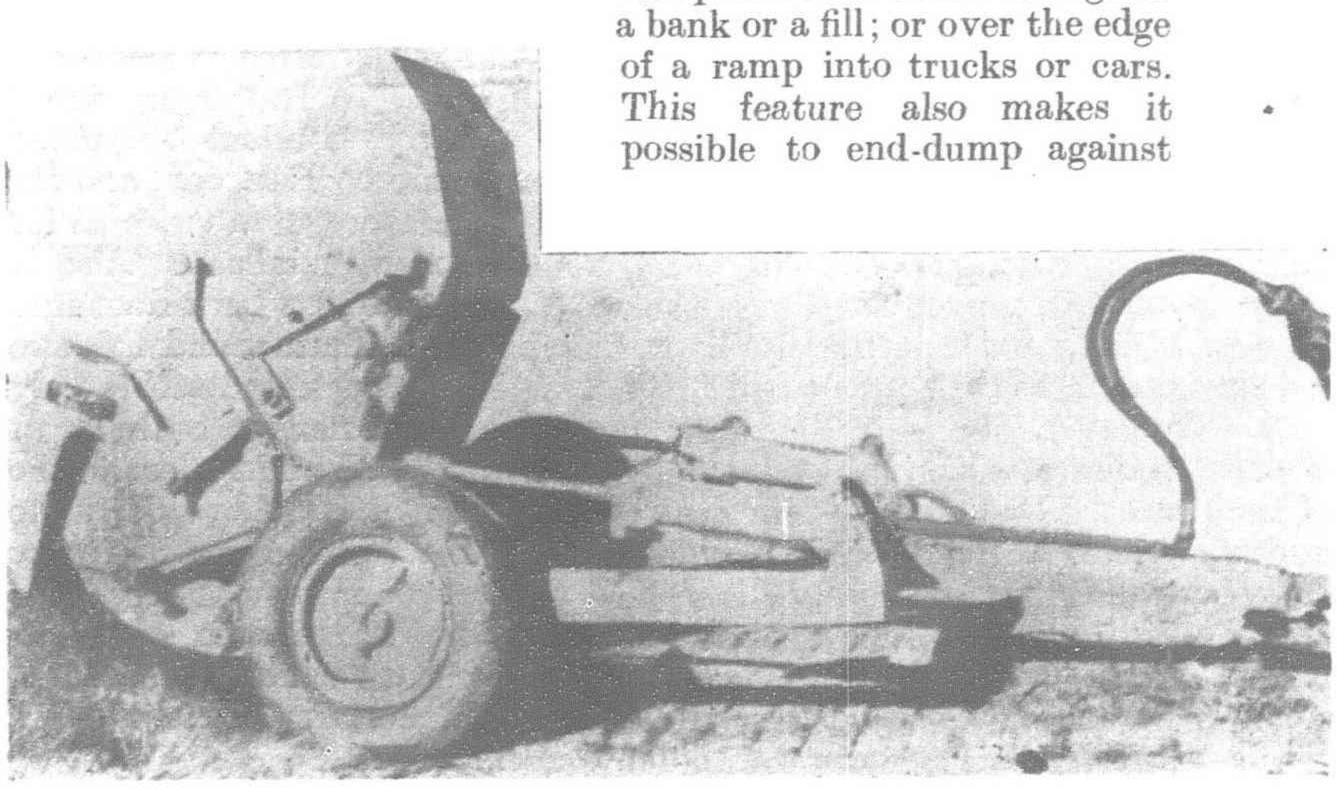


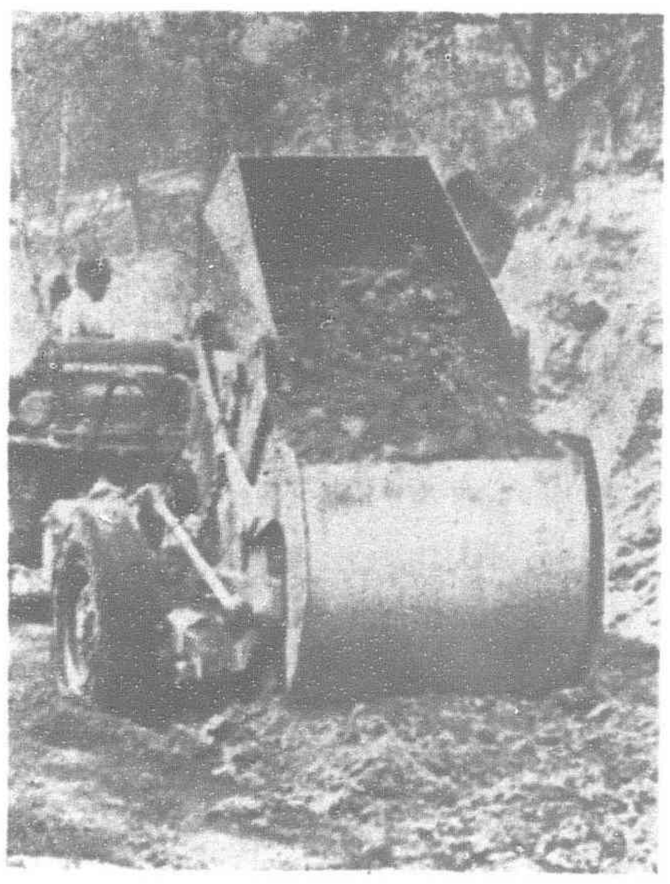
Similar in design and construction to the larger Bucyrus-Erie two-wheel scrapers, the H-28 operates on a safe low-pressure hydraulic system. It has the exclusive Bucyrus-Erie "double curve" cutting edge, and it dumps backwards and behind its wheels like a dump truck. Manufacturer claims the "double curve" cutting edge makes loading easy and quick by "boiling" dirt up into both apron and bowl of the scraper freely, easily, without dead action. Due to the boiling action, dirt does not tend to stick to sides or bottom of scraper and so falls out easily when the load is dumped.

The back-dumping feature makes it possible for the H-28 to dump its loads over the edge of a bank or a fill; or over the edge of a ramp into trucks or cars. This feature also makes it possible to end-dump against foundation walls, bridge abutments, or around culverts. When dumping on the level, loads can be spilled in a heap, and the adjustable floating tailgate floats over the dumped load without dragging material away from the dump. If desired, loads can also be dumped in windrows and spread.

Like all Bucyrus-Erie scrapers, the H-28 can be hauled by a tractor equipped with a Bucyrus-Erie bullgrader or bulldozer to make a combination unit. With the two-wheel scrapers, hydraulic pressure for both units is furnished by a single pump on the tractor, and each unit is controlled by a separate valve conveniently located beside the operator.

Since only a few features of the new H-28 can be described here, we suggest you write to this magazine or to Bucyrus-Erie Company, South Milwaukee, Wisconsin, for the complete story on this unusual dirt-moving tool.





Japan's Machine-Tool Industry Expands

Manufacturers Have Orders Outstanding to Maintain Operation of Plants for the Next Year

(Translated from the Kokusei Graph, New Year Special Number, 1940).

THE investigation made by the Nippon Kogyo Ginko (Industrial Bank of Japan) on the machine-tool industry in Japan is of great interest. Though some particulars cannot be published, yet the skilful description given statistically on the present state of our machine-tool industry is indicative of the great efforts that were exerted. Believing it will be of some significance, a general outline is given in the following.

Machine-tools are so to speak "tools for making machinery." As is well known, the development of industry in Japan has been chiefly based until quite recently on light industries such as the fiber industry. The remarkable advance made by heavy industries took place only in recent years. Therefore, it cannot be denied that Japan's heavy industries are still far behind those of the Western countries. The Manchurian Incident followed by the China Incident directly stimulated the expansion of productive power, which became the principal problem of industrial circles. Though the demand for machine-tools has increased considerably, the domestic power of production is unable to meet the demand, and even now a large amount of machine-tools are being imported from various foreign countries.

As part of its ambitious productivity expansion program, the Government has been taking all sorts of counter-measures since last year to boost by 2.5 times the local manufacture of machine-tools. Although there has been a virtual mushroom growth of factories in this field since the outbreak of the present China Incident along with the remarkable increase of demand for machine-tools, leading manufacturers still have such large orders outstanding that they can operate their plants for more than the full next year. And imports of machine-tools have been increasing markedly, although publication of the official trade returns for this item has been suspended.

So far as the machine-tool industry is a so-called "tools for making machinery" industry, it is obvious for the demand in the manufacture of tanks, machine-guns, rifles, airplanes, etc., the most important weapons of warfare, to show a marked increase. Especially, as machinery plays an important part in the execution of successful warfare, the consumption of arms indicate an enormous figure, which inevitably increases the production of machine-tools. Furthermore, the demand for machine-tools increases not only in the production of munitions but also with the expansion of the productive power of the general industry, and during peace time the demand is influenced by the condition of industrial circles, the changes occurring sharply in different years.

The nation's needs for machine-tools totalled Y50,000,000 in value in 1936, the latest year for which official statistics are available. As compared with 1931, or the year when the Manchurian incident broke out, the figures is eight times larger. A close observation of the current situation shows that demand at the present moment has multiplied 20 or 30 times on the same basis. Detailed figures for production, importation and exportation of machine-tools are subjoined below (in terms of Y1,000):

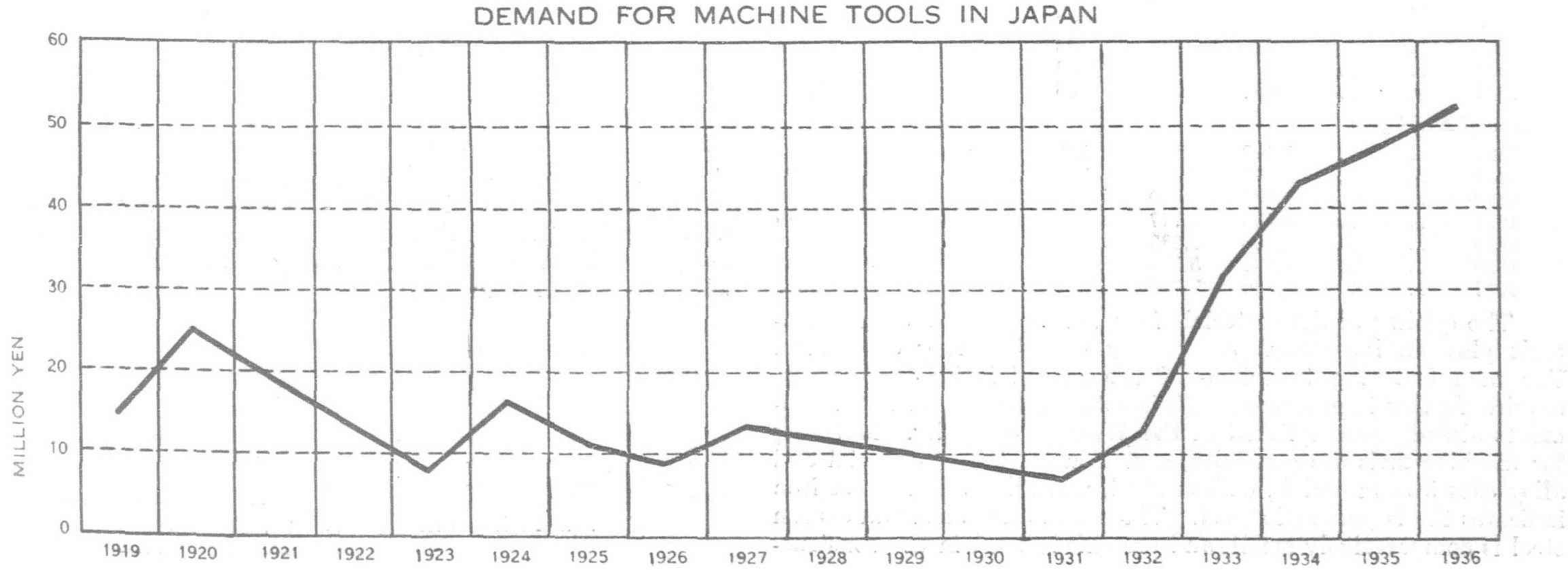
	Production	*Importation*	*Exportation*	*Demand*
1919	6,384	10,563	963*	15,958
1931	3,943	3,070	220	6,793
1933	15,503	16,247	566	31,184
1934	23,459	21,433	1,189	43,701
1935	30,176	18,296	1,941	46,531
1936	36,503	18,865	4,907	50,461
1937	—	—	5,798	—
1938	—	—	9,570	—
1939	—	—	—	—

(The asterisked figure include wood-working machines. This and all other tables in this survey are quoted from a monthly report published by the Industrial Bank of Japan).

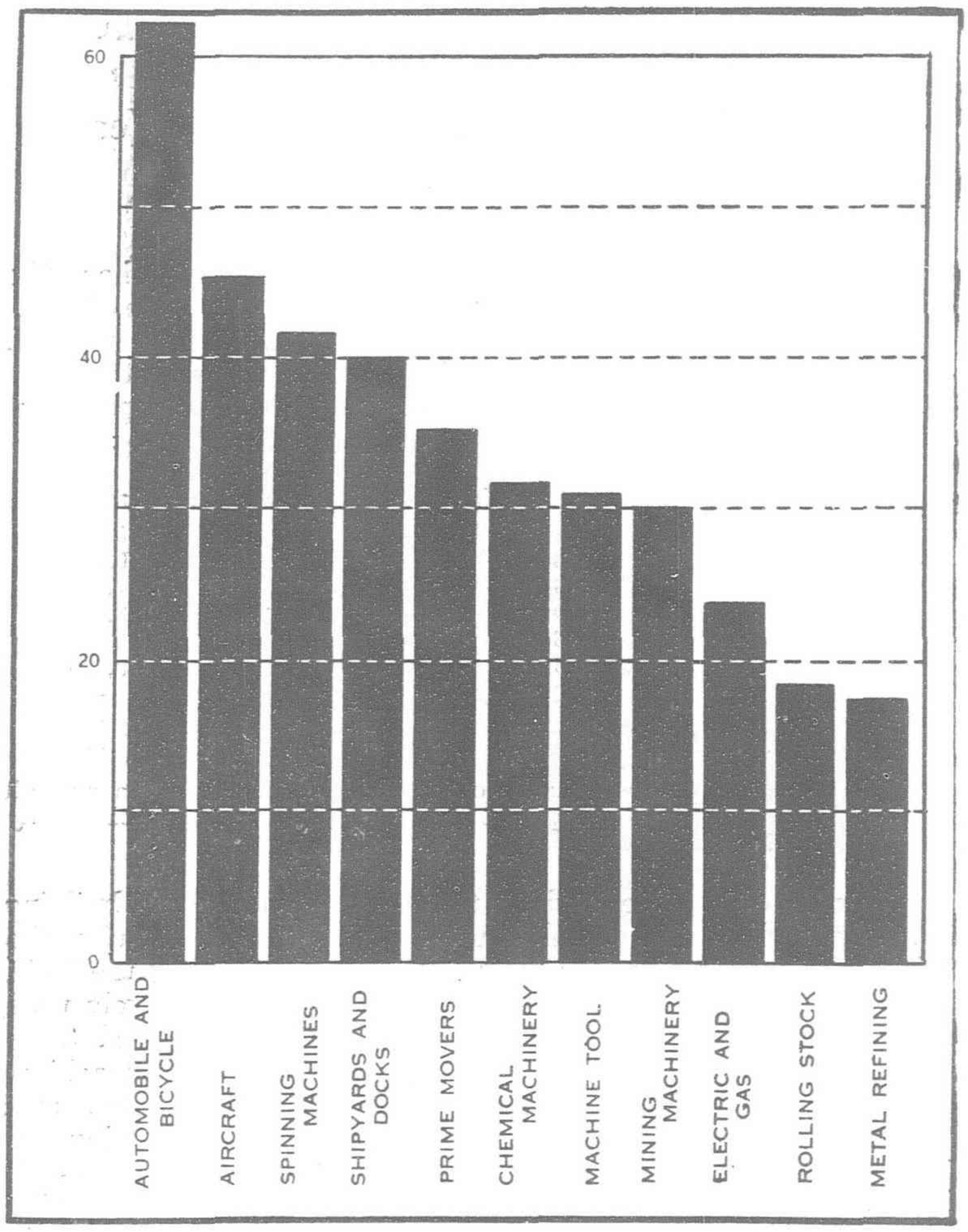
Machine-tools were used for the first time in the shipbuilding industry, and gradual developments have been made with the shipbuilding industry as its basis. In the early part of the Meiji Era (1868), machine-tools of foreign make were exclusively used and although the machine-tool industry is still far behind those in other advanced countries, it is about 50 years since machine-tools were manufactured for the first time in 1889 by the Ikegai Ironworks, Tokyo. The industry made great strides during the Sino-Japanese War (1894-95), the Russo-Japanese War (1904-05), and the World War (1914-18). So conspicuous was its exparsion in the World War days that not a few "get-rich-quick" firms in this engineering field came to bankruptcy in the subsequent period of world-wide depression. With the Manchurian Incident as a turning point, however, the industry began to flourish once more under Government protection.

The machine-tool industry in Japan is small in scale, with so-called small and medium-sized factories comprising more than half of the local production. Not until 1932 were there set up such large plants as employing more than 500 operatives. This is because low grade tools can easily be manufactured on a small scale by handwork. The upshot of it all is that there is an over-supply of inferior machine-tools, while the shortage of high grade tools has been assuming serious proportions. Thus, the Government is now planning to give priority to leading manufacturers in connection with the distribution of materials, the supply of funds, and so forth. Some idea of the scale in which the local

DEMAND FOR MACHINE TOOLS IN JAPAN



NUMBER OF MACHINE TOOLS PER 100 OPERATORS IN VARIOUS INDUSTRIES



machine-tool industry is operated can be obtained in the following table (the production, the number of factories and the number of workers employed being classified by scales, i.e., the numbers of employees per factory):

Production (Y1,000)	*5-15 Hands*	*15-50 Hands*	*50-100 Hands*	*100-200 Hands*	*More than 200 Hands*	*Total*
1931	2,663	3,677	644	971	2,242	10,216
1932	2,795	3,786	1,138	2,259	4,191	14,170
1933	3,580	7,932	3,613	626	10,029	25,780
1934	4,831	10,959	6,398	1,573	15,168	38,929
1935	5,148	11,882	10,424	4,601	14,526	46,580
	5-15 Hands	*15-50 Hands*	*50-100 Hands*	*100-200 Hands*	*More than 200 Hands*	*Total*
1931	395	64	6	3	2	470
1932	311	69	7	6	4	397
1933	344	125	16	2	6	493
1934	416	166	29	4	7	622
1935	495	209	43	10	8	765
1936	478	220	53	11	9	771
1937	622	297	56	26	20	1,021
Number of Employees						
1931	2,412	1,853	516	599	691	6,071
1932	2,221	1,972	546	1,095	1,844	7,678
1933	2,622	3,570	1,371	314	3,502	11,379
1934	3,433	4,777	2,337	592	4,380	15,519
1935	3,994	5,533	3,242	1,564	4,067	18,400
1936	3,931	5,186	4,040	1,758	4,884	19,799
1937	5,082	8,706	4,531	4,107	12,973	35,399

The quality of the materials for the manufacture of machine-tools play an important part during manufacturing operations. The manufacturing technique of the materials in the country requires further improvement as it is not comparable to the developments already accomplished in the Western countries. Materials for machine-tools are generally, cast iron (cast iron material and alloy cast iron material), carbon steel, and alloy steel. Cast iron indicates the largest ratio used. The use of alloy steel and carbon steel is comparatively small, and are chiefly used in the construction of important machinery parts and products of high grade. The ratios of principle materials that are being used according to an investigation made recently is given in table III.

TABLE III.—RATIO OF THE USE OF PRINCIPAL MATERIALS

Type	*Size*	*Grade*	*Cast Iron Material*	*Alloy Cast Material*	*Carbon Steel*	*Alloy Steel*	*Total*
	6 ft.	No. 1	72.0	1.1	5.5	21.4	100.0
	8 ,,	,, 2	79.5	1.3	12.5	6.7	100.0
Lathe ..	..10 ,,	,, 1	76.3	0.9	4.9	17.7	100.0
	14 ,,	,, 2	82.1	1.4	10.3	6.2	100.0
	Average		77.3	1.2	8.5	13.0	100.0
	3 ft.	No. 1	86.5	0.8	3.8	8.9	100.0
	4 ,,	,, 2	92.1	1.3	5.1	1.5	100.0
Radial Boring	5 ,,	,, 1	90.4	0.6	1.0	8.0	100.0
Machine	7 ,,	,, 2	94.6	0.6	3.3	1.2	100.0
	Average		90.7	0.9	3.3	5.1	100.0
	No. 1	No. 1	64.5	1.7	6.6	27.2	100.0
	,, 2	,, 2	73.5	2.4	8.1	16.0	100.0
Milling ..	.. ,, 3	,, 1	74.4	1.2	5.7	18.7	100.0
Machine ..	.. ,, 4	,, 2	77.5	1.4	7.6	13.5	100.0
	Average		72.5	1.7	7.0	18.8	100.0

As concerning the distribution of machine-tools among various industrial branches, no authentic figures are available. A perfunctory investigation made in 1936 shows that the automobile and bicycle industries as a whole use the largest number of machine-tools per 100 workers, followed by the aircraft industry. Details of the classified figures are quoted below:

Industries	*Total No. of Workers Employed*	*Total No. of Tools Installed*	*Number of Tools per 100 Hands*	*Number of Factories Investigated*
Prime Movers	1,799	418	35.0	5
Rolling Stocks	2,540	460	18.1	3
Automobiles and Bicycles ..	1,258	788	62.6	3
Shipyards and Docks	3,088	1,221	39.8	2
Mining Machinery	297	89	29.8	2
Spinning and Weaving Machines	948	392	41.3	2
Electric and Gas	1,856	451	24.2	2
Machine-tools	3,938	1,254	31.7	3
Chemical Machinery	350	115	32.8	2
Metal Refining	1,235	216	17.5	4
Aircraft	522	242	46.2	2

Out of the various types of machine-tools, the lathe is in most common use. Prior to the China Incident, the use of lathe indicated 40 per cent of all machine-tools, but with the development of special machinery there has been a gradual decline to about 30 per cent.

Although the publication of import figures has been suspended since the outbreak of the current Sino-Japanese hostilities details of the nation's machine-tool exports are made public. Exports in 1938 totalled Y9,575,000, involving 107,096 units of various machine-tools, as against Y5,798,000 in 1937 and Y4,907,000 in 1936. Needless to say, the recent increase of outgoings is due to the active shipment to the continent as may be noted in the following table (the unit in Y1,000).

Countries	*1936*	*1937*	*1938* *No. of tools*	*1938* *Value, Y1,000*
Kwantung Leased Territory ..	2,211	2,499	50,883	4,843
Manchoukuo	484	1,032	44,219	3,601
China	172	195	9,696	814
Soviet Asia	1,672	1,529	239	154
Australia	20	272	995	66
Britain	23	95	355	31
British India	171	239	389	22
Argentina	1	47	164	13

As to imports, so much is clear that the greater part of the nation's needs for machine-tools at present is being met with imported tools. The United States and Germany are no doubt heavy suppliers. Classified import figures for 1934-36 are listed below for reference (in Y1,000):

	1934	*1935*	*1936*
United States	8,810	7,956	8,486
Germany	9,246	7,323	7,162
Britain	2,172	1,862	1,919
Sweden	304	59	25
Switzerland	627	883	1,120
France	178	124	104
Czechoslovakia	—	—	18
Total (including others) ..	21,433	18,296	18,865

Leading machine-tool companies, with their dates of establishment, their authorized and paid-up capitals, and the sites of their plants in the order named, are shown in the following: Ikegai Ironworks: April, 1913; Y20,000,000, Y12,500,000; Mita (Tokyo), Kanagawa.

Niigata Ironworks: June, 1910; Y20,000,000, Y15,000,000; Niigata, Kashiwazaki and Nagaoka in Niigata Prefecture, and Kamata (Tokyo).

Hitachi Machine-tools Company: May, 1939; Y15,000,000, Y7,500,000; Omori, Kawasaki.

Karatsu Ironworks: April, 1916; Y5,000,000, Y5,000,000; Karatsu (Saga).

Okuma Ironworks: July, 1918; Y10,000,000, Y6,000,000; Ogino, Nunoike, Osone and Kokura (all in Aichi Prefecture).

Kokusan Seiki K.K: July, 1936; Y5,000,000, Y5,000,000; Adachi and Shibuya (Tokyo).

Dai Nippon Ordnance Company: July, 1938; Y30,000,000, Y7,500,000; Yokohama.

Osaka Kiko K.K.: February, 1915; Y12,000,000, Y8,500,000; Osaka.

Mitsubishi Electric Engineering Co.: January, 1921; Y?0,000,000, Y.22,500,000; Kobe, Nagoya, Nagasaki, and Tokyo.

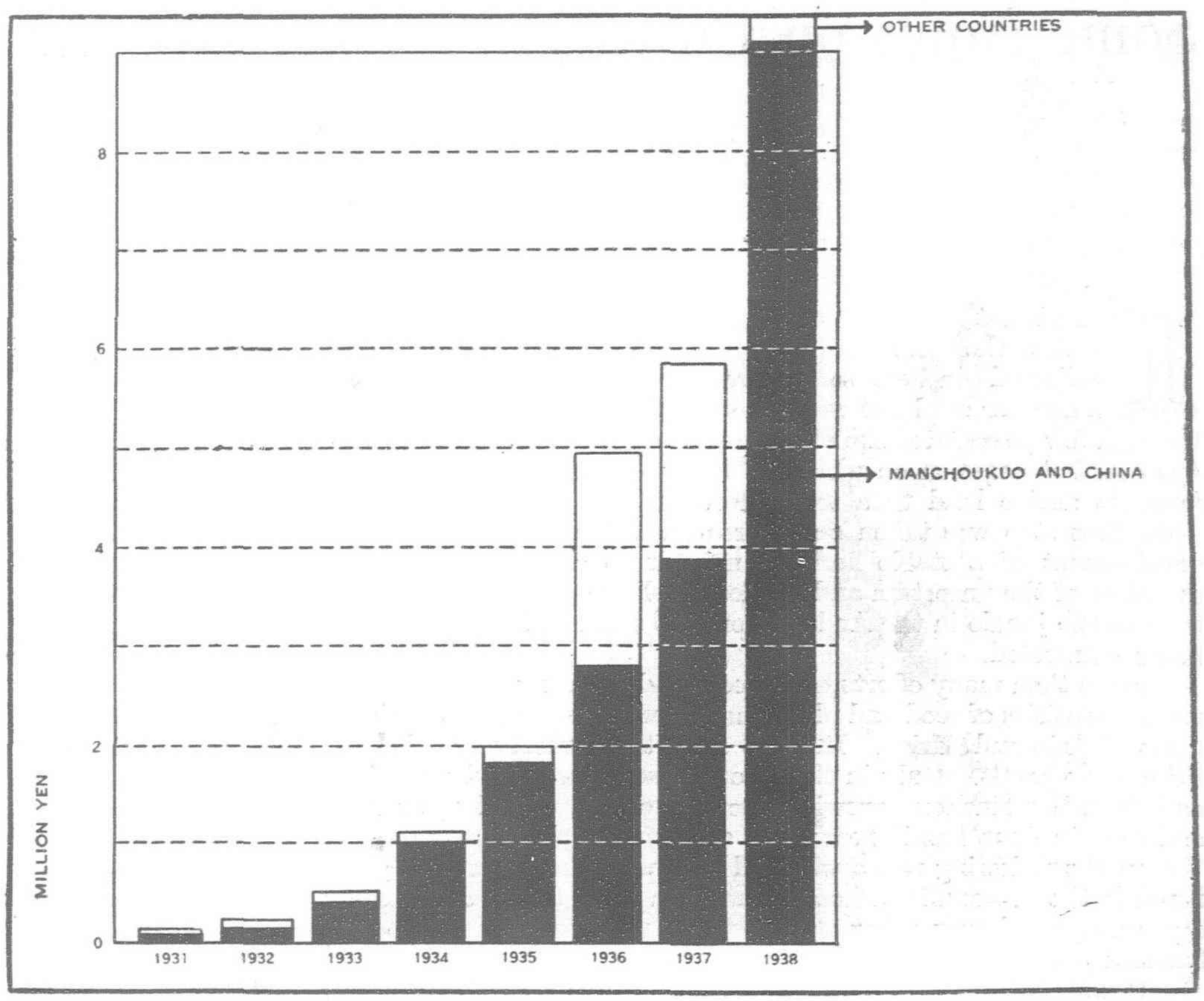
Shibaura Machine-tool Company: December, 1938; Y10,000,000, Y5,000,000; Tsurumi (Kanagawa).

Shinohara Machinery Works: October, 1934; Y9,000,000, Y7,000,000; Makuhari (Chiba).

Tokyo Machinery Works: March, 1916; Y7,000,000, Y4,000,000; Shinagawa, Mita and Meguro (all in Tokyo).

Tokyo Seiki K.K.: December, 1928; Y4,000,000, Y4,000,000; Maruko (Kanagawa).

EXPORT OF MACHINE TOOLS FROM JAPAN



Toyo Machinery Company: January, 1939; Y15,000,000, Y7,500,000; Shimomatsu (Yamaguchi).

Tsugami Ataka Works: March, 1937; Y2,000,000, Y2,000,000; Nagaoka.

Osaka Wakayama Ironworks: July, 1934; Y7,000,000, Y4,500,000; Kongu and Nobutayama (Osaka).

The Netherlands Indies as a Producer of Tin

(Continued from page 147)

means for modernizing equipment when times were most favorable for doing so. As an instance of the latter we may mention that during the past period of depression the company was able to place an order for a number of large bucket dredges.

In 1937 Dr. H. Colijn—at the time Minister for the colonies—introduced a bill proposing the amalgamation of the two great tin concerns of Banka and Billiton. The express object of this bill was to strengthen the position of the Netherlands Indies tin industry; it was to bring all the tin producing concerns under one and the same central management and effect a union between the government concern at Banka and the semi-government Joint Mining Company Billiton. So far the bill has not been passed.

Prices.—The prices resulting from the concluding of the International Tin Agreement have often been criticized recently, especially by Americans. Now it is extremely difficult to decide what may be regarded as a reasonable price level in a mining industry. For there are no two mines in which conditions are the same. Hence the price level must always be such that even the poorest mine may have to take part in production in order to supply the demand of the world market can make a reasonable profit. It would not be right, and it would not even be economical, to select the richest of all the tin mines in the world, exhaust the ore reserves therein and so be gradually brought to the point where it would be necessary to begin exploiting the poorer deposits.

If we take as an example Bolivia, a country in which 70 per cent of the total export is tin ore, while the nature of the ore deposits is such that the present price level just permits of a reasonable profit being made, it is obvious that a considerable reduction of the price level would mean the country's economic ruin. This does not imply that the lower prices would put an end to the tin industry in Bolivia, but it certainly means that in Bolivia this industry would be obliged to begin exhausting its richest reserves. This in its turn would lead to uneconomical exhausting of the world's ore-reserves, and it is short-sighted to suppose that lowering prices—which could quite well be done temporarily—would not be in conflict with the rational exploitation of tin deposits.

There is another point to be considered. The mineral wealth of every country must inevitably decline as exploitation proceeds. It is quite unnecessary for any country to dispose of its ores without making some profit out of the transaction. But if this is so, then we must admit that countries where conditions are more favorable than in those which are just able to make a reasonable profit, gain should be greater. Criticism of this is unreasonable.

Hydro-electric Project

For the development of the vast underground resources in Jehol Province and North China, particularly East Hopeh, and also to meet the rising demand for electric power by various enterprises, a plan has been drafted by the Manchoukuo Government in concert with the North China Provisional Government for a large-scale hydro-electric project on the River Lan which flows from Jehol into North China, across the Great Wall.

The hydro-electric resources of the Lanho were closely investigated this summer by the Manchoukuo Hydro-electric Construction Bureau, the survey revealing that there is available 800,000 kilowatts of power at eight points on the main stream of the river. As it is an international river flowing through both Manchoukuo and North China, co-operation of both countries in its development is desirable.

Some Notes on Cinchona Culture and the World Consumption of Quinine

By Dr. M. KERBOSCH

(Bulletin of The Colonial Institute of Amsterdam)

It is almost a century ago that the French explorer Weddell visited the Cinchona-bearing regions of South America and collected Cinchona seed there (1843-1848). From this seed a number of plants were grown in the Jardin des Plantes at Paris ; a few years later one of these was taken over to Java. This was the first occasion on which a Cinchona tree was transplanted from its native land to a tropical country in another continent —the first step was taken on the road which was to lead to the development of a stable and lasting culture of cinchona taking the place of the uncertain and reckless exploitation of the cinchona trees in the jungle in the Andes where the stock of these trees was being exhausted.

Since then many efforts have been made to grow cinchona and great quantities of seed and plants have been imported into various parts of Asia and Africa. In most cases these efforts have led to little or no result. Only in three countries, namely, India, Ceylon and Java has cinchona growing been developed on a large scale, and only in Java has it become of economic importance.

In the following pages we shall deal with the experience garnered in the course of cinchona growing in these three regions and say a few words regarding the economic prospects that have influenced the development of that culture.

It was not until a quarter of a century after the importation of the first cinchona plant into Java that the culture of this tree became general on the island. A sufficient number of plants of several varieties did indeed become available, first by the importation of seeds and plants (Hasskarl, Schuhkrafft) and later by exchange with India after the plants and seeds of Markham's expedition had been received in the latter country, and as a general rule these different varieties appeared to develop very successfully in suitable parts of Java. But as the plants grew older and became productive it appeared that the bark of all the varieties that were being cultivated had but a very low quinine content. Only *Cinchona officinalis* proved an exception, but unfortunately this particular variety was not really suitable for use as a commercial crop, mainly because it is highly susceptible to various diseases and grows very slowly.

The general opinion of the planters in Java was that large-scale production of cinchona bark with a low quinine content had no commercial future. This view was based on the fact that since Pelletier and Cavantou's discovery of quinine in 1820, there had been an increasing demand on the market for barks possessing a high quinine content which made them suitable for use in the manufacture of quinine.

As a result of this general attitude private planters evinced little or no interest in the new culture, which could only produce bark with a low quinine content. Interest was only aroused after 1873, when the first lots of Javanese cinchona bark with a high quinine content were put on the market and sold at a high price. These lots consisted of bark from plantations of *C. Ledgeriana*, a variety of cinchona that occurs in Northern Bolivia, and of which George Ledger, an Englishman, had had great quantities of seeds collected. In 1865 the Netherlands Government had purchased a pound of these seeds for experimentation in Java*.

The sale of this bark opened up new possibilities for cinchona growing on an economically profitable basis. Private enterprise immediately showed interest, and it was not long before numerous cinchona estates were established in Java, particularly in that part of the island known as the Preanger Regencies—even now the chief cinchona producing area.

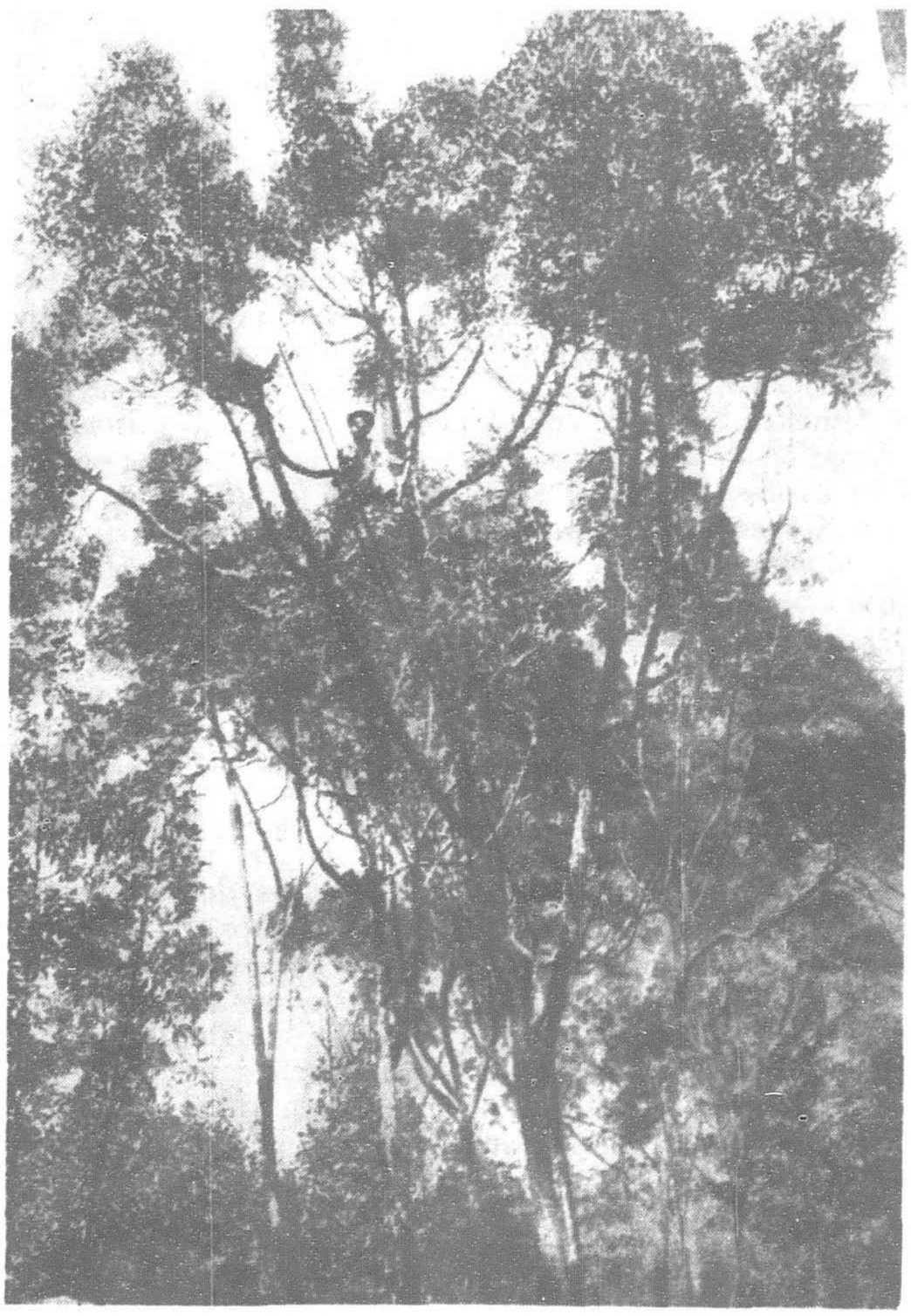
The new cinchona growing industry had the advantage of being able to base its development immediately on the use of the new high content variety. Furthermore it had at its disposal a vast amount of experience acquired in the experimental plantations of the Government. But above all it was a priceless advantage to be able to profit immediately by the first results of a rational selection instituted by J. C. B. Moens, Director of the Government Plantations, the moment the high content of the *Ledgeriana* variety had been established beyond question. All of which seemed to point to an excellent future for the new industry.

The first period of its existence was indeed very prosperous. But already in the 90's there arose a great difficulty which was to remain a permanent danger threatening the industry, namely, overproduction.

Encouraged by the first market successes achieved by the high content of the *Ledgeriana* barks, planters in Java had begun growing cinchona energetically. In a few years extensive and promising plantations were established. But in their great enthusiasm for the new culture, those interested had not reckoned sufficiently with a peculiarity which is characteristic of every industry growing a medicinal plant, namely, the limitedness of the demand. The market demand for a strong specific remedy, which has long been used by medical men, is naturally very inelastic, because its uses are strictly limited.

As a result of the rapid development of cinchona growing in Java (and Ceylon) production had so increased in a few years that the supply of cinchona bark sent to Europe became considerably greater than the demand. Consequences were not slow to make themselves felt ; prices began to drop, even falling below cost at times.

The situation became further aggravated when the Ceylon planters began rooting up their cinchona plantations and substituting tea, which promised better commercial prospects. The bark thus obtained was brought to market in such enormous quantities as to make a



Collecting cinchona seed

*By far the greater part of the seed collected by Ledger (13 pounds) was bought a little later by India for trial plantations in Madras and Bengal.

balance between supply and demand out of the question for a considerable period.

When at last these supplies of Ceylon bark were almost entirely absorbed by the market, the Java plantations began to produce great quantities of *Ledgeriana* bark with its high percentage of quinine sulphate. Hence the amount of quinine sulphate in bark form offered for sale remained considerably greater than the demand, in spite of the fact that Java was at the time the only country producing cinchona*. For nearly twenty years the influence of over-production was felt. Prices fell so low that many planters found it almost, if not entirely, impossible to make their plantations pay.

Matters only improved after cinchona bark producers in the Netherlands Indies made an agreement with the quinine manufacturers (1913), by which the supply and sale of cinchona bark were adjusted to the world consumption of quinine. The main purpose of the agreement is: to build up a cinchona industry that pays and to preserve it for the future. To achieve this object the amount of bark made available is entirely regulated to accord with world consumption; manufacturers buy annually a quantity of bark which, expressed in terms of quinine sulphate, corresponds to the amount of the latter sold in the same year. Hence the amount of bark producers can dispose of is limited; which naturally means a limitation of the harvest on their part.

This agreement put an end to the over-supply of cinchona bark for good, thus eliminating the chief cause of the economically unfavorable condition in which the industry had been for so long. Its object—to make cinchona growing pay and insure its future—has been fully achieved. But, naturally, it could not put an end to over-production itself. The balance obtained between available produce and consumption has only been achieved by an artificial limitation; the planters supply only a fraction of the amount of bark they could produce from their estates under normal exploitation. As a matter of fact, not only is the potential over-production of the Java cinchona plantations as much a fact as ever, but since the conclusion of the cinchona agreement it has even increased to a very great extent. Present plantations in the Netherlands Indies are actually in a position to produce considerably more bark than is harvested now.

Cinchona nursery, grafting "Ledgeriana" upon "Succirubra" stems

Efforts to introduce cinchona growing in Ceylon date from about 1861. The initial experiments were made with various kinds of seed collected by Markham in South America—chiefly seed of *C. succirubra* and *C. officinalis*. Later seed of *C. Ledgeriana* was also obtained.

Here, too, the planters showed little interest in the new industry at first. But when they began to see that their flourishing coffee plantations were falling victim to the much feared *Hemileia vastatrix*, they took recourse more and more to planting cinchona. After a while they began to regard cinchona growing as a last resort, as this new industry enabled them to replant the land where the coffee plantations were going to ruin. The result was that in a few years the cinchona industry in Ceylon had become very extensive, as the following figures show.

	Area of cinchona plantations in Ceylon
1873	1,500 acres
1879	20,000 ,,
1881	45,000 ,,
1883	64,000 ,,

As these extensive plantations gradually began to produce in earnest, the supply offered on the market increased rapidly. An ever-increasing percentage of the bark offered on the market was sold, and the unit price fell more and more. This condition grew worse when the market became acquainted with the *Ledgeriana* varieties from Java with their high quinine content. The prices offered for the low content Ceylon bark decreased to such an extent that the only thing seemed to be for growers to root up their cinchona plantations with all possible speed and begin cultivating tea—a new industry which at the time offered better economic prospects.

The following figures† will give the reader some idea of the rapid increase of production and the simultaneous fall of prices.

	Production of cinchona growing in Ceylon in kilograms	*Unit price in Netherlands cents*
1878	84,619	69
1880	526,381	72
1882	2,109,142	63
1884	5,374,971	33
1886	6,345,307	21
1888	5,662,476	12
1890	3,976,950	7.8
1892	3,101,573	5.4
1894	1,145,755	3

Ceylon had acquired the position of leading cinchona producer in a very short time. In an almost shorter time this industry disappeared again, once the effects of over-production began to make themselves felt. In 1883 there were still 64,000 acres planted with cinchona; ten years later this area had been reduced to 5,000 acres. The history of the cinchona industry in Ceylon shows clearly how easily the growing of a medicinal plant can lead to over-production and how illfated the effects of this are.

Unlike Ceylon, Java has been able to retain its cinchona cultivation, but only at the cost of going through a long period of ill-fortune during which the Hollanders' characteristic perseverance was very severely tried. In Java, indeed, cinchona growing was much benefited by the fact that from the very outset the guiding thought had been that the future of cinchona growing depended on the cultivation and selection of *C. Ledgeriana* with its high quinine content. The result was that Java-grown bark had a considerably higher content and hence the low unit-price did not work so much havoc in the Java industry as it did in Ceylon with its low-content varieties. But the factor which has, more than any other, contributed to the success of cinchona growing in Java has always been the fact that both climate and soil there are particularly suited to the cultivation of *C. Ledgeriana*.

In the history of the numerous efforts made in other countries to introduce cinchona growing, one point comes out very clearly, namely, that so far no conditions have been found anywhere favorable enough for the cultivation of *C. Ledgeriana* to yield economic results equal to those achieved in Java. Perrot‡ also speaks a

*Apart from the plantations in India, the produce of which was entirely intended for home consumption.

†Ch. Böhringer, in "Der Tropenpflanzer," XIII, 269 (1909).

‡Prof. M. E. Perrot, *Quinquina et Quinine*, p. 174.

Young "Ledgeriana" plantation with "Crotalaria" "Usara mocris" is bordering the terraces; old Ledgeriana plantations in the background

timely word of warning when writing on experiments in cinchona cultivation in Indo-China: "Mais, je ne saurais trop insister, qu'on ne se leurre point d'espoirs exagérés; la culture intensive industrielle du Quinquina ne paraît guére possible dans les colonies françaises, qui ne pourront jamais fournir, même après de longues années d'essais méthodiques rigoureusement indispensables, qu'un appoint plus ou moins important à leurs propres besoins." What Perrot says of French colonies applies to a greater or less extent to all tropical areas where experiments have so far been made in growing cinchona.

In India cinchona culture began as soon as the seeds collected by Markham in South America were received (1861).

During the first few years the kinds chiefly cultivated were *C. officinalis* and *C. succirubra*; later *C. robusta* was widely grown. Shortly after the importation of *Ledgeriana* seed into Java a large quantity of seed of this same variety was received in India. From this 60,000 plants were grown. These young *Ledgeriana* trees were set out in experimental plots in Madras and Bengal. It appears that the plots in the former presidency were extremely unsuitable for the cultivation of these kinds of cinchona, both as to climate and as to soil, in respect to both of which factors *Ledgeriana is* very fastidious, and by 1880 there were only some 50 plants grown from the imported seed left. In Java, on the contrary, almost all the *Ledgeriana* plants raised from the original seed were still alive.*

In Bengal, too, experiments were made with *C. officinalis* and *C. succirubra*. The experiments with *Ledgeriana* plants, which were begun about the same time as those in Madras, were more successful than the latter. Evidently the climate and soil of Bengal suits this variety of cinchona better than those of Madras. Even at the present time the Government cinchona plantations in Bengal grow very largely *C. Ledgeriana*.

But although Bengal has proved more favorable for the culture of *C. Ledgeriana* than Madras, yet years of experience have now made amply clear that neither area has either a climate or a soil of the kind to bring forth a thriving cinchona culture comparable to that of the Netherlands Indies. In both regions production is always far less than that of the cinchona plantations in Java.

After the world war India made a great effort to increase her output of cinchona bark as much as possible. New areas specially favorable for cultivating *Ledgeriana* were sought for. A thorough examination led to the conclusion that suitable areas were to be found in certain parts of South Burma and South India.

The first Burmese experiment was started in 1920 in a region which soon proved unsuitable as regards both altitude and rainfall. A move was therefore made to another locality South of Tenasserim, where the rains are less heavy and the annual rainfall more favorably distributed. At first the results appeared to be promising. The seed-beds were successful and the plants in the open ground thrived exceedingly (Report of the Botanical Survey of India 1923-24 and 1924-25). It now seemed as if a really promising cinchona-growing area "extending from the Tenasserim river eastward to the borders of Siam" had been discovered. But the succeeding Reports are less optimistic in tone. The climate is pronounced unsuited to the culture. The number of plants subject to diseases and insect pests is said to be alarmingly great.

In the 1926-27 Report we read: "It has now been proved by experience that, however well-suited for cinchona a locality may appear to be, there may be unforeseen or unknown factors which render it quite unsuitable for this fastidious plant." In the 1928-29 Report the results obtained are summarized as follows: "But the main lesson of the whole area is already proved. It will grow cinchona and may grow it at some profit under present conditions of world prices, but it will never be a first class area for the purpose."

Since then, it would seem, the prospects in regard to economically profitable production in South Burma have not improved. For when, in 1937, the experimental plantation which had so far been managed and financed by the Indian Government was transferred to the Government of Burma, the latter was not prepared to continue working it—which shows clearly that the local authorities saw little or no prospect of an economic future for this culture. As a result the trees were rooted up that very year and the area abandoned.

So this important experiment, started with great energy by men well versed in the matters involved and at the cost of considerable financial sacrifices, was abandoned after having been carried on for 18 years "avec une tenacité inlassable, avec l'esprit de suite, que mettent toujours les Anglo-Saxons dans la solution des problèmes d'agriculture tropicale, qui intéressent le développement de leurs colonies."†

In South India experimentation has been going on since 1925 in the Anamalai Hills, where there was an area of about 10,000 acres which had been pronounced well suited to cinchona growing. In 1930-31 there was a cinchona plantation of 939 acres here. Since then there has been no further extension of the area planted; hence the original plan, which involved 2,300 acres to be brought under cultivation, has only been partly realized.

The developed area was largely planted with *C. Ledgeriana*. From the very outset the planters had to fight a disease which is called in the Reports "die back." The 1927-28 Report has the following remark in regard to it: "The prevalence of disease makes the future not very reassuring, for the result is that large areas are lacking in an adequate supply of plants." According to later reports this disease is most troublesome in low-lying areas (2,000-3,000-ft.).

The plantations on the Anamalai Hills have been kept under normal exploitation ever since, and the figures have been regularly published (Cinchona Administration Reports). From these figures it appears that the production here obtained does not differ in any marked way from that rendered by the older plantations in Madras. It stands to reason that any comparative appreciation should take into account the fact that the Anamalai plantations stand on virgin soil.

A study of all the available data regarding cinchona estates in India shows that the average production of these plantations per hectare is less than a quarter of that obtained on Netherlands Indies cinchona plantations under normal exploitation. It is not without reason that private planters in India have long since abandoned cinchona culture as unprofitable. On this point the Government Cinchona Department of Madras reports as follows for 1930-'31: "Though areas suitable for an extended growing of the cinchona tree undoubtedly exist, it is unfortunately the case that its cultivation is by no means readily profitable, as can be

*In the government cinchona plantations in Java there are even yet some two hundred cinchona trees derived from the seed collected by Ledger. These trees are now seventy-five years old.

†Aug. Chevalier, Revue de botanique appliquée (Paris) iv, 393 (1924).

gathered from the complete withdrawal of private enterprise from cinchona growing."

Because quinine is a medicine of such overwhelming importance in the struggle to control malaria, many people, especially physicians and hygienists, evince the greatest concern as to whether there is a large enough production of this remedy to supply the world's needs. An answer to this question cannot be given without a thorough knowledge of the principal factors affecting the production, purchase and distribution of this drug.

Many people think that there is much too little quinine produced. Their idea is that measures should be taken to remedy this condition of affairs. Increased production, they say, would reduce the price, and since at present the price of quinine is supposed to be the great stumbling block in the way of its use in the struggle to suppress malaria, its becoming less expensive would mean a considerably increased demand.

In answer to this type of argument we may say, that facts do not support it. Especially instructive in this connection is the experience garnered during the period preceding the conclusion of the agreement between planters and manufacturers, when the price of bark was very low. For many years cinchona growers had produced and put on the market much greater quantities than were purchased in previous years. Now in spite of there being for a number of years an extra supply of bark actually sold at a low price, this particular period does not show any great increase in world consumption. It may be objected, that although there was plenty of bark to be had at a very reasonable price, yet the manufacturers of quinine kept the price of that drug so high as to impede the increase of consumption. But, as a matter of fact, during the greater part of this period the price of quinine was at a low level.

An experience of more recent date teaches the same lesson. In 1933 the official price of quinine dropped 25 per cent and has ever since remained at the same low figure without world consumption having increased materially. If it had really been true that world consumption was hampered by the high price of quinine, a fall of 25 per cent in the price must surely have been followed by a noticeable increase in the demand. That this has not been the case corroborates the previous experience, namely, that the relation between the price and the consumption of quinine cannot be expressed in the simple formula : the lower the price the greater the demand.

I will now attempt to show that the above relation is indeed different and more complicated than might at first appear.

The demand for quinine is affected in the first place by the fact that this commodity is not an ordinary article but a very potent drug. Naturally, medicines are strictly limited in their use and have therefore a limited market. Hence their position is different from that of, for instance, tea or rubber. Efficient propaganda may make people tend more and more to replace other drinkables by tea or to use rubber instead of other raw materials. But the possibility of increasing the demand for a long-established, well known, very potent, specific remedy by trying to oust some other commodity in its favor is so small as to be practically negligible.

People who can be expected to purchase a medicine are those who need it for its properties as a specific remedy. If they want to buy such a commodity for their private use they have to obtain it from a retail dealer in medicines. Now such retail prices are very little affected by fluctuations in wholesale prices. If, for instance, the wholesale price of quinine falls considerably, the price of quinine sold retail may be hardly affected, if at all. As a general thing the decrease in the wholesale price will hardly be noticeable at all to the consumer who buys the medicine for private use. But even if the retail prices were reduced, this fact would mean little to the purchaser, since quinine is a remedy that is only taken in small doses. Besides, in the case of a higly potent specific remedy one cannot expect the public to buy greater quantities merely because of a decrease in price.

Thus we see that a fall in wholesale prices cannot be expected to cause any appreciable increase in the retail demand for quinine.

Original "Ledgeriana" trees derived from the seed imported from South America, age 60 (1924)

But the total amount of quinine sold annually is only partly accounted for by retail consumption. Another not inconsiderable portion thereof is supplied to various governments engaged in a struggle against malaria. These latter transactions usually involve large quantities and therefore we may assume that in their case the price will influence the market, in that the authorities will be more apt to undertake a malaria prevention campaign or increase the scope of such a campaign, if the price of quinine is comparatively low. It is only reasonable that price and consumption should thus mutually affect each other but, as will be shown presently, the price of quinine is by no means the only factor, nor even always the most important one, when we are considering the quininization of malarial areas.

At first sight it does seem as if there might be reason to fear that perhaps malaria prevention by the use of quinine might be hampered by the price of this remedy. For is not the market now entirely dominated by the manufacturers since the agreement between them and the producers was concluded? Experience shows that a position of this kind very easily leads to forcing up of prices. Hence it is not to be wondered at that many people think there are substantial grounds for expecting the price of quinine to be forced up to so high a level that the use of this medicine on a large scale for the struggle against malaria would become difficult.

Should such results indeed flow from the conclusion of the above agreement, it would undoubtedly deserve general condemnation. For the Government of the Netherlands Indies such consequences would certainly be quite impossible of acceptance and absolutely contrary to the standpoint maintained by the Government ever since cinchona growing began. To promote this culture the Government spared neither money nor effort; but it was not the hope of financial gain that constituted its primary motive in so doing. Although the Government has ever been willing to lend a helping hand in the building up of a flourishing private industry, its intention has always been first and foremost, to ensure the regular production of a medicine indispensable to humanity and one which threatened to become insufficiently available in the future. Its point of view was clearly described by Rochussen when he wrote in 1862 : "Ce n'est pas comme spéculation, c'est comme acte humanitaire, que le Gouvernement néerlandais a entrepris et poursuivi cette oeuvre." If indeed the position arising from the quinine agreement should lead to a hampering of the fight against malaria prevention by quininization, this would mean that the chief aim of the Government was being completely frustrated. In view of such an eventuality the authorities, true to the original policy, have taken measures to insure that nothing shall be allowed to stand in the way of malaria control. The government therefore

signed the agreement on behalf of its own plantations only on condition that the following regulations should be accepted.*

(1) The participants in the agreement undertake to endeavor as far as possible to supply quinine at special rates to areas specially in need of this drug.

(2) The Government of the Netherlands Indies reserves to itself the right to withdraw in case it is of opinion that the quinine agreement is becoming an impediment in the way of supplying quinine to malarial areas.

Furthermore the Government has appointed a commissioner whose special duty it is to assure himself that the above provisions are never lost sight of.

In this manner the Government so arranged matters as to safeguard the supply of quinine at special rates for the fight against malaria, and moreover the bark growers themselves are interested in promoting this particular aspect of the market. For cinchona cultivation in the Netherlands Indies has a potential production far exceeding the amount consumed in recent years. If this potential surplus could be entirely or partly disposed of for systematic quininization, a very real interest of the producers would be materially served. For if this could be achieved the industry would be freed from the shackles of a restriction that is becoming increasingly hampering and has made the exploitation of cinchona plantations a very abnormal one.

That considerably more quinine could be consumed in the struggle to control malaria than is used at present is an unquestionable fact. Striking figures are available illustrating this point with reference to India. According to data published by the League of Nations Health Organization the number of persons suffering from malaria in that country is estimated at 100 million. Only eight to ten million are treated annually. The amount of quinine sulphate that is needed to supply the country adequately with this remedy is said to be 680-700,000 kg, while the total consumption is actually only a small fraction of this.

In many other extensive malarial areas the quantity consumed is also far below that really needed for regular, curative treatment of the malaria-stricken population.

How is it, then, one wonders, that there is so great a need of quinine, while at the same time the cinchona growing industry in the Netherlands Indies is able and willing to produce considerably greater amounts of bark than it does at present ? Some of the most important factors involved in the answering of this question will be called to the reader's attention in the following paragraphs.

In extensive malarial areas the population is usually much impoverished ; private buying power is so small that there is no question of the people buying enough of the drug regularly themselves. The only solution of the problem is for the Government to purchase the necessary amount for free distribution.

Governments that are actually doing this are usually supplied with the quinine they require at a rate lower than the official price. Hence we see that in this connection both manufacturers and producers are already endeavoring to promote the use of quinine by reducing the price. Furthermore, it is the duty of the Government commissioner to investigate whether in fixing the prices to be charged due consideration has been given to the above quoted clauses of the cinchona agreement, which were aimed at preventing the convention from becoming a stumbling block in the way of quininization by demanding too high a price for the drug.

As pointed out already, this price moderation and the supervision exercised by the Government are both efforts to attain the same end, namely, to promote the quininization of malarial areas. Yet, quite wrongly, many people think that quininization would be undertaken in all malarial regions, if it were not for the one and only insurmountable obstacle—the price of the drug. The fact of the matter is that the problem is complicated by obstructive factors which often carry more weight with the governments concerned than the expense involved in the purchase of quinine.

First there is the fact that in almost all countries disbursements for defense occupy a disproportionate and ever increasingly large part of the budget. The inevitable result of this is that other expenses have to be curtailed so that important projects, including hygienic measures, cannot be carried out. If, however, this financial drawback could be made to disappear so that the Governments would have sufficient funds available for the purchase of the necessary quinine, even then quininization of malarial areas would by no means be assured. For to gain this end it is necessary to have, in addition to the drug, a well-organized administrative machine for the distribution thereof under medical supervision, and, as it happens, the requisite organizations are lacking in most of the countries concerned. These would have to be built up from the very foundations—which in many cases is practically impossible owing to the absence of the necessary trained workers. Besides, the establishment and upkeep of organizations of this kind involves very large sums of money—a financial burden often considerably heavier than that put upon the exchequer by the purchase of an adequate supply of quinine. It is the difficulty and expense of establishing and keeping up an efficient organization which in many cases forms the real obstacle in the way of quininization of extensive malarial areas.

An inquiry held in 1931 by the League of Nations Health Organization has led to the conclusion "that the world consumption of quinine is still far below the minimum necessary for the treatment of all malaria cases." The conviction of the truth of the above has given rise in the past few decades to efforts at introducing the cinchona growing industry into various countries. None of these efforts has resulted in making considerably more or cheaper quinine available for malaria control, nor is it likely that any of them will do so in the near future. Neither have the attempts to substitute other cinchona alkaloids or synthetic drugs for quinine been sufficiently successful to cause the latter any serious loss of significance as a reliable medicine, especially when it comes to mass treatment of malaria. Hence the need of more quinine for combating malaria is felt in many countries by men who take an outstanding place in the struggle against this scourge. And this need will be felt more urgently still when disbursements for defense return to normal once more and Governments are thus placed in a position to spend larger sums on measures to provide for the hygienic welfare of malarial areas.

In all likelihood the problem of the world's quinine supply will then once more occupy a prominent place in public interest. In the opinion of the present writer, the first problem of practical importance for anyone wishing really to make more quinine available for combating malaria is the very timely question : How can matters be so arranged that the huge quantities of quinine, which existing plantations in the Indies could produce over and above their present output, may be applied to the struggle against malaria ? As we have seen, there are a number of factors which favor the possibility of malaria control by quininization. These factors are once more summarized below :

The existing plantations in the Netherlands Indies could produce considerably more than the present world consumption demands ;

the Netherlands Indies Government has at its disposal sufficient guarantees to prevent the position resulting from the agreement between the manufacturers and producers being misused in a way which would hamper malaria control ;

cinchona growers would welcome the opportunity to increase their output, as this would enable them to carry on their business on a more normal footing ;

the agreement which has united practically all producers and manufacturers, has given rise to the possibility of putting regularly at the disposal of malarial areas large quantities of quinine for longer periods.

Besides these favorable factors there are, as we have already seen, circumstances which exert a contrary influence and which have managed to prevent the superabundance of the Java cinchona estates becoming available for the curing of millions of malaria patients. No stone should be left unturned in the effort to clear these stumbling blocks out of the way. If ever international co-operation to promote a juster distribution of products be achieved, then doubtless quinine, the remedy *par excellence* against one of the greatest ills that flesh is heir to, will be one of the first of these products to claim serious attention.

*The Government cinchona growing concern puts into the hands of the State so large a part of the total production of this culture, that without Government co-operation the quinine agreement could not achieve its purpose.